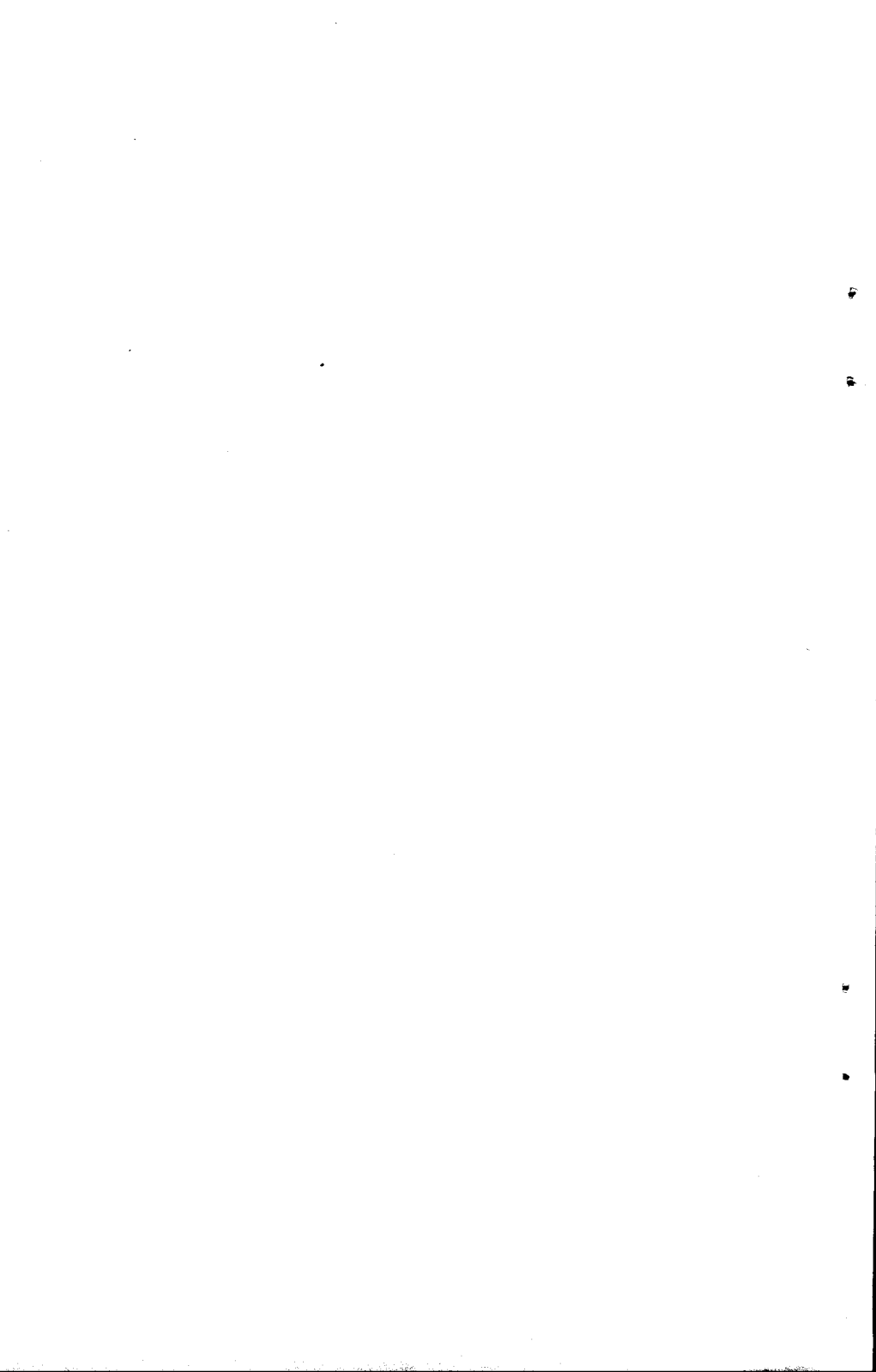

**CALGARY WORKING PAPERS
IN LINGUISTICS**

Number 21 Winter 1999

**THE
UNIVERSITY
OF
CALGARY**

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FOREWORD

The editors of this volume, Susan Atkey, Jana Belland, Melanie Strickland and Lorna Rowsell are pleased to present the twenty-first issue of the *Calgary Working Papers in Linguistics* published by the department of Linguistics at the University of Calgary. The papers contained in this volume represent works in progress and as such should not be considered in any way final or definitive.

This issue of *CWPL* includes papers from both graduate and undergraduate students in the Department of Linguistics, as well as a guest submission from a Ph.D. student at the University of Munich. The articles in this journal discuss a range of topics from the fields of syntax, historical linguistics and child language acquisition.

The first submission by Rebecca Hanson is the first of two acquisition papers, and examines Ouhalla's Split Infl Hypothesis within the framework of acquisition of syntax. Hanson concludes that Ouhalla's model accounts for the acquisition of negatives and auxiliaries in English. A second syntax paper, submitted by Ellen Andrews, examines bilingual children's acquisition of the Pro-drop parameter. Andrews argues that infants simultaneously acquiring a [-pro-drop] and a [+pro-drop] language will not behave differently than monolinguals.

In addition to the acquisition articles, this issue includes two papers written in the field of Syntax. Susan Atkey's submission discusses multiple wh-movement and Superiority effects in Czech. Atkey argues that Superiority in Czech does not parallel that found in Serbo-Croatian but that in Czech superiority only applies to non discourse-linked wh-words. Andrea Wilhelm examines the event structure of German. She compares two proposed analyses of event structure: Ritter and Rosen's versus Hale and Keyser's. Wilhelm asserts that Hale and Keyser's model correctly accounts for the German data presented, and points out some problems with Ritter and Rosen's model.

Two papers on historical linguistics are also included in this issue. The final topic of research in this volume is that of Historical sound change. The guest submission from Laura Catherine Smith of the University of Munich proposes a new approach to the phenomenon known as Germanic Verscharfung, or Holtzmann's Law, arguing that it represents a strengthening of laryngeals and not of glides as previously proposed. Tanya Therien addresses the issue of Altaic historical linguistics. The Turkic language family has posed some difficulties for both typological and historical linguistics. The pivotal issue that Therien discusses is four modern Turkic phonemes and their relation to Chuvash.

We wish to express our sincere gratitude to Linda Toth for her assistance in this project. We would also like to thank the University of Calgary Department of Linguistics for providing the necessary funding to produce this volume. A final word of thanks is owed to each of our contributors for their submissions to *CWPL* volume 21.

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Calgary Working Papers in Linguistics is an annual journal which includes papers by faculty and students in Linguistics and related disciplines, both at the University of Calgary and elsewhere.

The editors would like to encourage all readers to submit papers for future publication. The deadline for submission of papers is August 30 in order to meet the publication date. The editors would like contributions on 3 1/2" Micro Floppy Disks (preferably formatted for Microsoft Word for Macintosh version 5 or higher). We further request that the submissions follow the Style Sheet provided at the end of the journal. All submissions should be camera-ready. Page numbers should not be included on the front of the papers, but should be lightly printed on the back of the pages in pencil. Authors should submit their papers to the address listed below. The editors reserve the right to return papers for revisions if they do not conform to the Style Sheet as outlined at the end of the journal. Appearance of papers in this volume does not preclude their publication in another form elsewhere.

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Split INFL and the Acquisition of Neg and Aux

Rebecca Hanson

University of Calgary

Abstract

Because child language is human language, it is important that proposed linguistic theories be able to account equally well for both child and adult speech. This paper examines a model of split-INFL, which was proposed for adult language, from the perspective of acquisition. With a focus on the acquisition of English negatives auxiliaries, I test the ability of this model to account for the earliest observed stages of child speech in these areas. Data from several children learning English is considered and the model is found able to predict and explain the common patterns. The hierarchical structure within INFL accounts for the word order in the first instances of negation, the relative order of appearance between negatives and auxiliaries, and the fact that the earliest auxiliaries were negated. The success in these areas suggests that a further, crosslinguistic look at the role of split-INFL in acquisition would be worthwhile.

1.0 Introduction

From the perspective of acquisition, it is important that any proposed syntactic theory should correctly predict the observed stages that children follow (Weinberg 1990; O'Grady 1997). In order for a model to be acceptable, then, it must not only account for the emergence of adult-like utterances, but also for the errors that children commonly make. The purpose of this paper is to test the model of Split INFL proposed by Ouhalla (1990) according to these criteria. I will focus on the acquisition of negation and auxiliaries, since it is especially in regard to these elements that Ouhalla differs from the other proposals outlined below.

The organization of the paper is as follows. I begin by outlining the theoretical framework I am assuming, with a brief discussion of the specific hypotheses that will be important to my analyses. In Section 3, I focus on Ouhalla's model, and present and analyze the acquisition data by which I will evaluate it. In the course of the analysis, I find that this model can effectively account for the relative order of acquisition of negatives and auxiliaries in English. I conclude with a brief summary of the paper and proposals for further evaluation of Ouhalla's Split INFL in the acquisition of languages other than English.

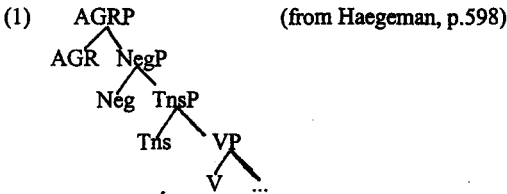
2.0 Theoretical Assumptions

2.1 Government-Binding

In this paper I will be working within the theoretical framework of Government-Binding, as developed by Haegeman (1994, based on work by Chomsky 1981, 1986a, 1986b, and others).

2.2 Split INFL Hypothesis

This hypothesis proposes that INFL be decomposed into TP (a maximal projection headed by Tense) and AGRP (a maximal projection headed by Agreement). Theoretical motivations for Split INFL are provided in Haegeman (1994, ch 11.2). Drawing on work by Pollock (1989) and Belletti (1990), she summarizes the data from French and English, which prompted Pollock to elaborate the structure within INFL. The model she presents (a pruned version is supplied in (1) below) follows Belletti in the ordering of Tense (Tns) and Agreement (AGR), and includes Pollock's proposal that negation (Neg) heads its own maximal projection (NegP). Modal auxiliaries, she assumes, are generated under AGR, while the auxiliaries *have* and *be* are generated in VP.

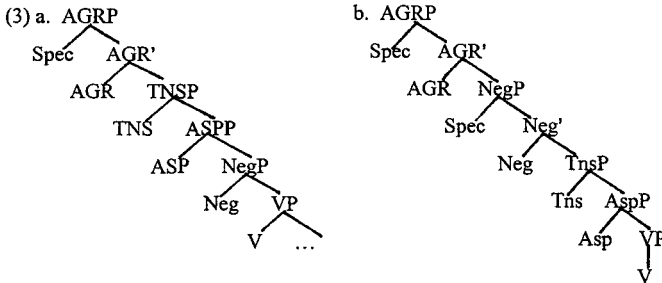


Ouhalla (1990) motivates and defends a model of the Split INFL which differs from Haegeman's in several important ways. First, Ouhalla re-analyzes all auxiliaries (*have*, *be* and modals) as aspectual elements, projecting AspP, which can be found either above or below NegP in the tree, language-specifically. Second, he proposes the NEG Parameter based on the cross-linguistic behavior of Neg:

- (2) The NEG Parameter (Ouhalla p194)
- a. NEG selects VP
 - b. NEG selects TNS(P)

Ouhalla examines the implications of this parameter, and bases on them two possible representations of split INFL. These are given in (3) below, taken from

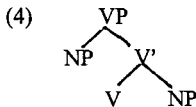
Ouhalla, p.208. (3a) represents a Neg Parameter setting of (2a); (3b) represents (2b).



Ouhalla cites English and Turkish as languages with structure (3a), while French and Berber have (3b). (3a) will be central to the discussion in Section 3 below.

2.3 Structure Building Hypothesis

In this paper I assume, with Guilfoyle and Noonan (1992; hereafter G&N) and Radford (1994), that children begin acquisition with only the grammatical categories (N, V and A), and that functional categories such as Tns and Neg are acquired according to a maturational schedule. This theory of the building of acquired structure, always in conformity with UG Principles, is known as the Structure Building Hypothesis (G&N). The structure I will assume for the earliest stages of acquisition, given in (4), is presented and motivated in G&N (p.251), and has been used to account for such varied acquisition phenomena as lack of case, null subjects, and lack of passives in early speech (G&N p.243).



In Section 3 below, I will look at a possible approach to the building of NegP and AspP onto the initial structure in (4).

2.4 VP-internal Subject Hypothesis

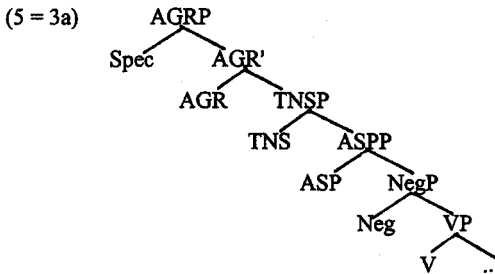
Following Koopman and Sportiche (1988, 1990, cited in G&N), I assume

that subjects are base-generated in Spec, VP. In regard to child language, this means that from the beginning of acquisition, children represent subjects in that position.

As the maturation schedule gives them access to functional categories, they elaborate the structure in (4) accordingly, in response to the input.

3.0 Data and Discussion

Ouhalla's model of Split INFL and the Neg Parameter were introduced in Section 2.2 above. This discussion will be concerned with setting (2a) of the Neg Parameter, which implies the structure in (3a; repeated here as (5)). Recall that English was cited as a language, which employs this structure.



Given the Structure Building Hypothesis, and the initial structure assumed in (4) above, this model makes certain predictions about the relative order of acquisition of negation, auxiliaries and tense. In the following discussion, I will examine these predictions and, looking at English acquisition data, determine if they are correct.

3.1 Ouhalla's model: predictions for acquisition

The structure in (5) above implies that negation (Neg) would emerge very early in acquisition, and that utterances at this early time would show no Tense (Tns) or Aspect (Asp). Under Ouhalla's model, this means that modals and auxiliary verbs, as Asp elements, should be absent from the first stage of Neg usage. A further prediction, but one which will receive less focus in this paper, is that Tns markings should appear only after NegP and AspP are projected.

In summary, the predictions of the structure in (5) are:

- (6) A. Neg appears early
- B. Neg before Asp
- C. Neg, Asp before Tns

3.2 Acquisition data

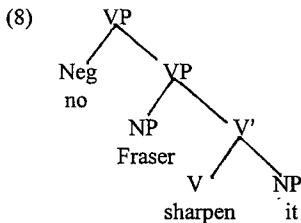
In a much-cited study of the acquisition of English in three children, Klima and Bellugi (1966; hereafter K&B) isolated the instances of questions and negatives over the first three of Brown's (1973) Stages of acquisition. They noted the aspects of the grammar that were emerging in each stage, and gave representative examples of negatives and questions. Below, I present the relevant aspects of K&B's discussion, focusing on negation and auxiliaries in Stages I and II, and consider how Ouhalla's model might account for these observations.

Stage I (MLU=1.75)

At this earliest stage we find, as expected, Neg already appearing. Some examples are given in (7) below, with their sources.

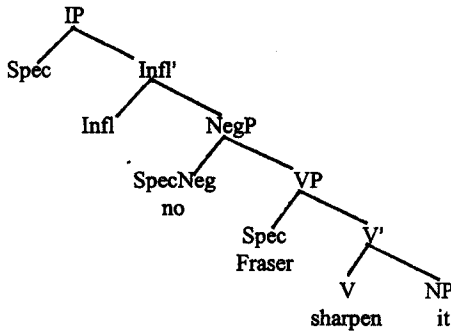
- (7) No sit there; No play that. (K&B, p.192)
- No mom sharpen it. (G&N, p.266)
- No mommy doing. (Deprez&Pierce, 1993:36)

G&N, and Radford (1996) propose that at this point, the Neg element *no* is in specifier (spec) position of a VP-adjunct, as in (8), taken from G&N p.267.



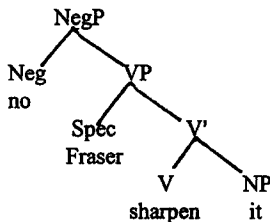
Deprez & Pierce (1993:36), arguing against a structure-building account, instead place Neg within NegP, which is situated between IP and VP as in (9; using the token from G&N). Spec, IP and Head, IP are empty.

(9)



Since I am assuming here both a structure-building approach and Split-INFL, I can combine aspects of (8) and (9). Without committing to a full IP at this early stage (thus remaining within a Maturational account), and without drawing on an adjunction strategy, the presence of Neg can be accounted for by (10) below.

(10)



The newly projected NegP accounts for the presence of negation, while the absence of tense and aspect are due to the lack of TnsP and AspP, respectively. Note that (10) conforms to Prediction (6A) and to the relevant setting of the Neg Parameter, since NegP immediately dominates VP.

However, a possible difficulty we face already is the presence of apparently inflected forms such as "doing" (see (7) above). Further examples of this sort are provided in (11) from K&B (p.192).

- (11) a. No singing song.
2. No the sun shining.

Brown (1973:274) notes that the *-ing* suffix, which is used in the formation of English progressive aspect, is present from very early on in child language; K&B

include examples (including 11 a, b) in Stage I. It would seem, then, that aspectual inflection is being used alongside the earliest Neg forms -- contrary to Prediction 6B.

However, it is not necessarily the case that the forms in (11) indicate a projected AspP. The English progressive is not composed of the *-ing* marker alone; it also involves the auxiliary *be*. Since all auxiliaries are missing entirely at this stage (K&B p.192), we can conclude that the presence of the *-ing* suffix in (6) does not necessarily indicate that it is generated under AspP; it could be lexically represented with the verb. Its early appearance could be due to its frequency and saliency in the input.

Since the presence of *-ing* does not directly imply AspP, and since child utterances at this point include negation but not tense or aspect, we can conclude that at Stage I, the predictions based on structure (5) above are borne out.

Stage II (MLU=2.25)

This stage sees the emergence of two auxiliary forms: the modals *can't* and *don't*, which are restricted to negative sentences (K&B p.194). K&B analyze these first modals as "lexical representations of V^{neg} since there are no occurrences of *I can do it; Can I have it? He shouldn't have it; They aren't going*, etc." (p.195). I propose instead that they are analyzed as aspectual elements, which are not yet fully distinct from Neg.

Samples of the first aspectuals are provided in (12). Data is from K&B, p.193-4.

- (12) I can't see you. I don't like him.
 We can't talk. I don't know his name.

The model in (5) above can explain why *negative* aspectual elements should appear first: NegP is projected before AspP. However, it does not in itself explain why the first auxiliaries should be modals, and why they should only ever occur with the contracted Neg.

To the first question -- why modal auxiliaries appear first -- we can refer again to the issue of saliency. Auxiliary *have* and *be* are often contracted; modals, on the other hand, are very rarely contracted and thus are more salient.

The second question -- why *negative* modals -- is more difficult to answer. If we assume, with K&B, that *can't* and *don't* are purely negative forms, how do we account for the fact that the children seem to associate the aspectual meanings with them? Consider the examples in (13, from K&B), where adult-like comprehension (13a) and production (13b) of the negated Asp are demonstrated:

(13) a. Adam (MLU=2.25)

Mother: I don't know that song, Adam. *Child*: Why not?

b. I can't see you.

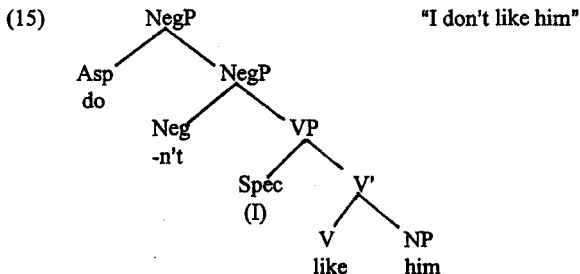
K&B also note that "don't and can't are restricted to occurrences before instances of non-progressive main verbs" (p.195). The fact that these forms are assigned a specific distribution suggests that there is some sort of aspectual representation at this point (distinct from the Negs *no* and *not*) which they are making use of. For example, there are no examples of utterances like (14), where *don't* has the same the same distribution as *not*:

(14) *He don't little, he big. (vs. *He not little, he big.* K&B p.194)

On the other hand, the fact that the modals never occur without Neg, suggests that AspP is not yet projected.

We can reconcile this seeming contradiction, if we assume that Asp has in fact been acquired, but it is not projecting its own maximal projection. This situation could occur for one of two reasons: Asp could be adjoined to NegP; or, it could be forming a complex head with Neg.

Consider the adjunction proposal first. If we assume that Asp at this stage is in spec position of an adjoined NegP, the resulting structure is (15)¹.



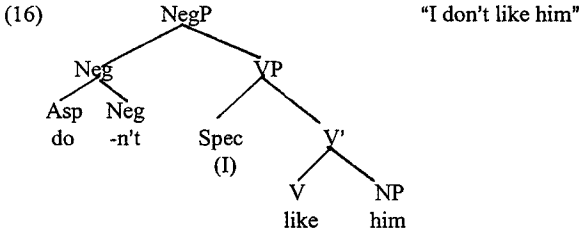
The aspectual element's position inside NegP makes it easier to account for its

¹ It is beyond the scope of this paper to motivate or discuss the position of the pre-Neg subject in the sentences in (12) above; for proposals, see Deprez and Pierce (1993) and G&N. For convenience, in my discussion, I will leave the subject in its VP-internal position, with brackets to indicate my neutrality about its S-Structure position.

obligatory negative form. Haegeman (1994:387) uses a “balcony” metaphor to describe the adjunction structure: a balcony is both inside and outside the building it is attached to. Similarly, *do* in (15) could be considered both inside and outside the NegP. Because it is “inside” the NegP, the modal must always be negative in form; because it is “outside,” it can retain the semantic function of an aspectual.

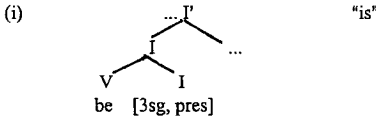
A problem with this approach, however, is the nature of Asp at this point. If Asp is not yet projecting AspP, an adjunction structure is strongly disfavored for the following reasons: I am assuming that UG principles apply at all stages of acquisition (see Section 2.3 above); however, “principles of UG determine that only a phrase (not a head) can be adjoined to another phrase” (Radford, 1994, citing Chomsky 1986:88).

Also, spec position is a phrasal, not head, position (cf. Cowper p.140). A second problem involves the affixal nature of Neg on the modals. The adjunction structure allows for the possibility of non-contracted Asp-Neg forms such as *do not* and *can not*, which are not attested. Consider instead the second possibility: Asp is located in head, NegP, and forms a complex head with Neg, as in (16)².



In this structure, there is no difficulty with Asp being a head: it must be, in order to form a complex with Neg. Also, the obligatory suffixal nature of Neg in (12) above, is more readily explained: items in a complex head are often expressed together (consider the example in note 5, where [*be+3sg pres*] is pronounced “is”). Further support for (16) comes if we assume, with Ouhalla (p.212 note 16), that

² This structure compares to that resulting from V-to-I movement, given in (i):



forms like "hasn't" and "wasn't" in adult English are complexes formed by the movement of the Neg element *n t* to Aux (Asp). That is, in the target language, Neg and Asp end up combining as proposed here.

I conclude, then, that the early negative modal forms *can't* and *don't* are represented more effectively by the complex-head analysis (16) than by the adjunction analysis (15) because the former involves no departure from UG principles and better explains the contracted Neg.

Note, in passing, that at this stage there is still no evidence of Tns:

(17) He no bite you. Book say no. Mom pinch finger?

Thus, Prediction 6C is also successfully borne out: both Neg and Asp elements appear before tense.

4.0 Conclusion

The purpose of this paper has been to examine the predictions of Ouhalla's model of Split INFL against acquisition data. In the discussion in Section 3, I found that this model was able to deal successfully with the first two stages of Neg and Asp acquisition. Potentially problematic data was dealt with by drawing on well-established factors of both developing and adult grammars: the early appearance of the progressive *-ing* was attributed to saliency factors; the negative status of the first auxiliaries was analyzed as the result of an Asp-Neg complex in head, NegP.

This paper has examined only a small part of a much larger issue: the role of Split INFL in the acquisition process. In Section 2.2 I presented Ouhalla's two proposed models of Split INFL: in Section 3 I examined only one of them. Further analysis of Ouhalla's model, then, should involve at least one example of the other structure, (3b). For example, French acquisition data could be considered (recall that French is proposed to use (3b)). Also, the discussion here was limited to Stages I and II; in order to fully evaluate any model of Split INFL, the analysis should be extended. In particular, the relative order of acquisition between Tns and Agr should be examined in later stages of acquisition.

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Infant Bilingualism and the *Pro-drop* Parameter

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Abstract

No research has been done to assess the occurrence of null and overt subjects in young bilinguals simultaneously acquiring a [+*pro-drop*] and a [-*pro-drop*] language. Previous research indicates that monolinguals set the *pro-drop* parameter at a very early age. Failure to use null and overt subjects language appropriately in this population can be attributed to performance, rather than competence, factors. Research also indicates that bilingual language acquisition is neither significantly qualitatively nor quantitatively different from monolingual language acquisition. However, code-mixing is a phenomenon that characterizes bilingual acquisition. Syntactic code-mixing is extremely rare. Code-mixing does not stem from a lack of language differentiation (the Unitary Language Hypothesis) but is instead attributable to factors such as language dominance, stage of development and sociolinguistic factors. As such, it is predicted that young bilinguals simultaneously acquiring a [+*pro-drop*] and a [-*pro-drop*] language will have similar levels of null and overt subjects to monolinguals acquiring each type of language. However, syntactic code-mixing may lead to a slightly higher incidence of null subjects in the [-*pro-drop*] language than in monolinguals acquiring this type of language. It is proposed that a longitudinal study be carried out to test these predictions.

1.0 Introduction

Currently, there is no published research studying the presence and absence of overt subjects in young children simultaneously acquiring a [+*pro-drop*] language, such as Spanish, and a [-*pro-drop*] language, such as English. This paper will examine the literature surrounding both bilingual language acquisition and *pro-drop* with the goal of predicting the behaviour of this bilingual population.

In section 2.0, *pro-drop* and the *pro-drop* parameter will be considered in young monolinguals. Throughout this paper, the continuity hypothesis will be assumed: young children possess all syntactic categories and have similar tree structures to adults.

Bilingualism and its effects on language acquisition will be discussed in section 3.0. It will be shown that, while young bilinguals may occasionally mix syntactic structures and lexical items between their languages, this phenomenon is limited in scope and frequency of occurrence. This code-mixing does not stem from a lack of language differentiation but is instead explicable by a number of other factors.

Based on the information presented in the above two sections, it will be predicted that infants simultaneously acquiring a [-*pro*-drop] and a [+*pro*-drop] language will not behave significantly differently, whether qualitatively or quantitatively, than monolinguals with respect to *pro*-drop.

2.0 Pro-drop

Amongst the world's languages, *pro*-drop is a very common phenomenon. The term *pro*-drop refers to a characteristic of many languages in which certain pronouns in tensed clauses can be phonetically null: thus, in these languages, null subjects are grammatical. Spanish and Italian are typical examples of [+*pro*-drop] languages. Examples of *pro*-drop for Italian are given below in a matrix and in an embedded clause:

- (1) a. Sono bravo tato
am good boy
"I am a good boy"
- b. Sembra che ama Mary
seems that loves Mary
"It seems that she loves Mary"

(source: Valian 1990, 1991)

It is currently widely accepted that a phonetically null noun phrase, *pro*, appears in the Spec of IP position in the sentences in (1) above (see for example Hyams, 1986; Valian, 1990). In consequence, the sentences in (1) are assumed to have the representation given in (2):

- (2) a. *pro* sono bravo tato
am good boy
"I am a good boy"
- b. Sembra che *pro* ama Mary
seems that loves Mary
"It seems that she loves Mary"

Pro-drop is not considered to be an independent phenomenon: it tends to pattern with various syntactic features within a language. For example, [+*pro*-drop] languages do not make use of modals or expletives, freely allow post-verbal subjects and show no that-trace violations (Rizzi, 1982; Valian, 1991).

Additionally, Hyams (1986) has proposed that in *pro*-drop languages another non-overt NP, *PRO*, is found in INFL. *PRO* contains person, number and gender features that match the subject. Hyams specifies that *PRO* governs *pro* but is not itself governed as this would constitute a violation of *PRO* theorem, which states that *PRO* must not be governed.

Hyams' proposal is controversial and will not be accepted for the purposes of this discussion. Firstly, the placement of *PRO*, a maximal projection, in INFL, a head position, is inconsistent with X-bar theory. Secondly, research on acquisition has not supported some of the predictions stemming from this theory (see 2.1; Valian, 1989).

Although *pro*-drop is a complex phenomenon, correlated with various other syntactic features, we will ignore these details for the purposes of this discussion. Our predictions will only concern the appearance of null subjects in the utterances of young bilinguals, and not other aspects such as expletives and modals.

2.1 The *pro*-drop parameter

Pro-drop is often argued to be governed by a binary parameter. Children are born with a default setting, either to allow *pro*-drop ([+*pro*-drop]) or to prohibit it ([-*pro*-drop]). Certain types of input will trigger the automatic and irreversible resetting of the parameter to its marked value. If no such input is received, the parameter will remain at its default setting. "As a theory of acquisition, parameter-setting portrays the child as a device which, given normal input, automatically and deterministically sets the correct value of each parameter" (Valian, 1990:107). There is much debate surrounding the initial setting of this parameter and the required input to trigger parameter resetting. Hyams (1986; Hyams & Wexler, 1993) believes that the parameter is initially set at [+*pro*-drop], while Valian (1990, 1991) and Bloom (1990, 1993) hold the opposite opinion.

Valian (1990) argues convincingly that the parameter cannot initially be set as to simply permit *pro*-drop¹. This would force children acquiring a [-*pro*-drop] language, such as English, to somehow observe that they did not hear sentences without overt subjects regularly, a case of negative evidence. Hyams

¹ Valian does not argue for the default parameter setting to be either [+*pro*-drop] or [-*pro*-drop], but rather for a combination of the two. The subtleties of her arguments are not relevant for this discussion as we accept that, regardless of its initial setting, the *pro*-drop parameter is set early in acquisition.

(1986) maintains that the relevant input to parameter resetting is not the presence or absence of overt subjects, but rather the behaviour of INFL. Since the co-appearance of *PRO* and modals in INFL would constitute a violation of the *PRO* theorem, and *PRO* is present in languages with null subjects, the development of modals will, in theory, trigger the appearance of overt pronominal subjects. However, Valian (1989) found no clear relationship between the emergence of modals and the emergence of lexical subjects in the speech of children. If a child uses lexical subjects, s/he does not necessarily use modals and vice-versa.

Based on this evidence, we will assume that the default parameter setting is [-*pro*-drop], the English-like option; children are born assuming that their language does not permit null subjects.² However, regardless of the arguments surrounding the default setting of the *pro*-drop parameter, what is clear is that this parameter is set at an early stage of language acquisition.

2.2 Occurrence of overt subjects

Valian (1991) conducted a study comparing the use of overt subjects in American versus Italian children. She found that even among the least linguistically developed participants (MLU 1.53-1.99), "almost 70% of the children's utterances with verbs include subjects--more than double the rate of Italian children" (47). Valian concludes "that at least soon after MLU 2 American children exhibit no competence deficit [in the use of overt subjects]" (48).

While some researchers have found lower rates of overt subjects in English speaking children than did Valian (see for example Hyams & Wexler, 1993), there is no need to doubt Valian's conclusion: the *pro*-drop parameter is correctly set at an early age (in this case, 2;0) and at a low MLU (approximately 2).

2.3 Accounting for the absence of overt subjects

If children have the correct parameter setting at an early age, how can the appearance of null subjects in their utterances be accounted for? Several examples of null subjects which would be considered ungrammatical in adult English are cited by Hyams and Wexler (1993) in (3) below:

- (3) Shake hands.
Turn light off
Want go get it.
Show Mommy that.
Not making muffins.

² Another possibility is that there is no default parameter setting and that children set the parameter fully upon exposure to some minimal amount of input. This possibility will not be considered as long as it will have no bearing on our hypotheses or conclusions.

Performance, rather than competence, explanations can account for these utterances. Bloom (1990, 1993) gives evidence that processing limitations may lead to the deletion of subjects in young children. Gerken (1991) proposes a prosodic explanation for the deletion of certain subjects: initial weak syllables of a metrical foot have a tendency to be omitted.

While children acquiring a [-*pro*-drop] language may occasionally delete subjects, this is not because they believe they are learning a [+*pro*-drop] language. At least from MLU 2, children have correctly set the *pro*-drop parameter. However, before we can consider the implications of this conclusion in bilingual children, it is necessary to examine the issues surrounding bilingual language acquisition.

3.0 Bilingual Language Development and Code-mixing

It has been asserted that half the world's population is bilingual (Grosjean, 1989). Certain studies have indicated that bilingual language acquisition by young children does not differ significantly from monolingual acquisition (Swain, 1972). Bilingual language acquisition is even said to occur at a comparable rate to monolingual acquisition (Padilla & Liebman, 1982). However, there are certain noticeable effects of having two languages in the utterances of bilinguals. Code-mixing is one such phenomenon.

Code mixing refers to "the alternation or mixing of language within discourse" (Lanza, 1992). Genesee, Nicoladis, and Paradis (1995) have further developed this definition for the study of very young children:

The term "mixing" has been used most often to refer to the co-occurrence of elements from both languages in a single utterance (intra-utterance mixing). This definition, however, precludes children in the one-word stage and, therefore, it is useful to extend it to include mixing across utterances (even of the single-word variety) with the same interlocutor, which we will refer to as INTER-UTTERANCE MIXING. This broader definition of mixing permits us to examine mixing in younger children - those in the one- and early two-word stage.

Examples of both types of mixing are presented in Volterra and Taeschner (1978). At 2;2 the Italian-German bilingual Giulia made the intra-utterance mixed form:

- (4) Giulia gemacht a casetta per a böse Wolf.
"Giulia made a little house for the bad wolf."

Her sister, Lisa (2;5), when speaking with her mother, replies in Italian to a German utterance, an example of inter-utterance mixing.

- (5) M: Was ist das hier?
 “What is this?”
 L: Occhiali
 “Glasses”

Both forms of code-mixing are quite common in infant bilinguals.

The specific nature of code-mixing, its extent and the theory advanced to account for it will be addressed in the following sections.

3.1 Occurrence of code-mixing

In children, lexical code-mixing has been extremely well studied. While there are no conclusive norms of the extent to which this type of code-mixing occurs at different ages and developmental stages in young “balanced” bilinguals (those whose two languages are approximately equally developed), a variety of researchers have measured the occurrence of this phenomenon.

Redlinger and Park (1980) calculate the percentage of mixed utterances by dividing the number of mixed utterances by the number of multiple word utterances. They evaluated their four subjects by assessing their level of mixing in relation to Brown’s stages (1973). “Stage I mixing levels were between 20% and 30%, Stage II levels tended to be between 12% and 20%, Stage III levels between 6% and 12%, and Stages IV and V between 2% and 6%. Mixing rates were thus seen to decrease with advancing linguistic development.”

Genesee et al. (1995) found that their subjects, aged 1;10 to 2;2, showed very low rates of intra-utterance mixing, the highest level being between 6% and 7%. The children demonstrated higher levels of inter-utterance mixing. This appeared to be tied to language dominance, a factor which will be discussed in section 3.2.

Finally, Vihman’s (1982) son, Raivo, had 34% mixed utterances at 1;8, 11% at 1;11 and 4% at 2;0.

Syntactic code-mixing occurs less frequently than lexical code-mixing. Meisel (1989) conducted a study on the bilingual acquisition of French and German by two children, aged 1;0 to 4;0. He showed that “bilingual children use different word order sequences in both languages as soon as they begin to produce multi-word utterances” (28). These children also behave language appropriately in terms of subject-verb agreement. As *pro*-drop is a syntactic, not a lexical phenomenon, we would expect it to follow the same patterns observed by Meisel.

3.2 The Unitary Language Hypothesis

Before we move on to predicting the behaviour of *pro*-drop in infant bilinguals, it is necessary to address one of the main explanations put forward to account for code-mixing. The Unitary Language Hypothesis (Genesee, 1989) proposes that code-mixing results from a lack of language differentiation at the early stages of bilingual acquisitions: before the age of at least 2;0 (and possibly later), infant bilinguals believe they are acquiring a single language. This hypothesis has been advanced by a number of researchers, including Volterra & Taeschner (1978) and Redlinger & Park (1980). The former authors even contend that lexical differentiation precedes syntactic. If this hypothesis were true, it would be impossible to make reasonable predictions about the behaviour of young bilinguals in the case of *pro*-drop. However, this view has been largely discredited. Meisel (1989; see 3.1) demonstrates that young bilinguals learn syntax at a rate and in a manner comparable to monolinguals and rarely mix their languages. Genesee et. al. (1995) show that young bilinguals predominantly use the appropriate language in conversation. Code-mixing cannot be accounted for by a lack of language differentiation. Therefore, it is necessary to consider the factors which can lead to code-mixing.

All bilinguals, whether simultaneous or sequential, are capable of, and in at least some situations do, code-mix. This applies even to fluently bilingual adults (de Fina, 1989). The extent to which code-mixing occurs depends on a number of factors. Three of these will be considered: language dominance, stage of development, and sociolinguistic concerns. Obviously, this is not an exhaustive list of plausible explanations for code-mixing.

Most bilinguals do not have equal proficiency in both of their languages. Code-mixing often occurs in a child's weaker language due to a lack of lexical and syntactic resources (Lanza, 1992; Genesee et. al, 1995). Missing words and structures may be borrowed from the dominant language. It is unclear whether language dominance would influence the occurrence of *pro*-drop in the bilingual population under discussion.

Code-mixing may also result from incomplete language development: "mixing may decline with development, not because separation of the languages is taking place but rather because the children are acquiring more complete linguistic repertoires and, therefore, do not need to borrow from or overextend between languages" (Genesee, 1989). In support of this, Padilla and Liebman (1982) note that syntactic, morphological and lexical items do not develop at the same time in each of a bilingual's languages. Some code-mixing in infant bilinguals may simply be the result of inter-language borrowing in order to compensate for a not yet developed structure in one language, an option not available for monolinguals. Because the *pro*-drop parameter is set very early, language development may not be a factor in the behaviour of this domain.

Finally, de Fina (1989) discusses a wide variety of sociolinguistic and discourse factors that lead to code-mixing in adult bilinguals. These include quotations, addressee specifications, emphasis and focus, message qualification (elaboration and clarification), topic-shift and mode-shift. Grosjean (1989:9) further identifies a bilingual speech mode "where both languages are activated [and] bilinguals become quite different speaker-hearers [than in the monolingual speech mode]." There is no reason to doubt that some or all of these sociolinguistic and discourse factors may apply to infant bilinguals. Studies on this population have noted definite sociolinguistic effects on code-mixing (see, for example, Lanza, 1992).

4.0 Pro-drop in the Bilingual Infant: Hypotheses

Having examined both the theoretical and acquisition literature surrounding *pro-drop* as well as the linguistic development of bilingual infants, predictions can now be made concerning the interaction of these two areas. The following facts pertaining to the appearance of null subjects in a young child simultaneously acquiring a [+*pro-drop*] and a [-*pro-drop*] language should be considered:

- 1) *Pro-drop* is a syntactic, not a lexical, phenomenon.
- 2) The *pro-drop* parameter is set very early in language acquisition.
- 3) Bilingual language acquisition resembles monolingual language acquisition.
- 4) Syntactic code-mixing is rare.

Therefore, one would expect that young bilinguals would behave very similarly to monolinguals in their treatment of *pro-drop*. For example, an Italian-English bilingual child should produce null and overt subjects at rates comparable to those proposed by Valian (1991; see 2.2) for Italian and English speaking monolinguals. Again, the young bilingual will show performance difficulties, attributable to factors such processing limitations and prosody (see 2.3).

The hypothesis that young bilinguals will behave like monolinguals in their treatment of *pro-drop* is supported by studies of second language acquisition. Hilles (1986) observes that adult second language learners of a [-*pro-drop*] language whose first language is [+*pro-drop*] proceed through stages of acquisition comparable to those of a monolingual child acquiring a [-*pro-drop*] language. There is no reason to doubt that bilingual children will develop along monolingual stages in each of the languages they are acquiring.

There is a possibility that the type of bilingual infants described above will have a slightly higher incidence of null subjects in their [-*pro-drop*] language than monolinguals learning the same language. This could be due to sociolinguistic factors, such as emphasis or quotation (see 3.2). It is unlikely that a higher incidence of null subjects could be attributed to the *pro-drop* parameter not yet

being set. Valian (1991) argues that this parameter is correctly set by MLU 2 (age 2;0). Prior to this point, it is nearly impossible to assess a child's use of subjects in any language since all their utterances are extremely restricted in both length and surface complexity.

5.0 Research Proposal and Conclusions

It is predicted that infant bilinguals simultaneously acquiring a [-*pro-drop*] and a [+*pro-drop*] language will behave similarly to monolinguals with respect to each language. If infant bilinguals do not behave as hypothesized, all the research that indicates that bilingual language development is comparable in each language to monolingual development will need to be reassessed. A strong interaction between a bilingual's languages is not expected. A much higher occurrence of *pro-drop* in a [-*pro-drop*] language than in monolinguals would certainly hint at this type of interaction.

In order to test the above hypothesis, a study should be conducted on a group of infant bilinguals simultaneously acquiring these two types of language. Participants should be chosen who have *approximately* equal exposure to, and have achieved *approximately* equal levels of development in, their two languages.³ As discussed in 3.2 above, it is unclear what effects language dominance would have on the appearance of overt subjects in these children.

The participants should be recorded regularly from a young age, certainly no older than 18 months. This would allow the time the *pro-drop* parameter is set in each language to be assessed.

Separate elicitations should regularly be carried out in each of the participants' languages, perhaps alternating weekly. Wherever possible, the person gathering the data should be monolingual. As discussed in section 3.2 above, a variety of sociolinguistic factors influence code-mixing in adult and infant bilinguals. If young bilinguals are highly sensitive to sociolinguistic cues, they may display higher rates of code-mixing (even the rare, syntactic kind) in the presence of a researcher who indicates (whether deliberately or accidentally) that she understands both languages than in the presence of a researcher who cannot understand the language not being tested. The bilingual researcher may well accidentally trigger the bilingual speech mode in the participant so that both her languages are activated (Grosjean, 1989; section 3.2).

³ Totally balanced bilinguals may be impossible to find. As Grosjean (1989) emphasizes, the bilingual is not two monolinguals in one person: "... they [bilinguals] will develop a formal competence in each of their languages to the extent needed by the environment" (8). As such, the researcher should attempt to find participants with approximately equal skills in both languages all the while being aware that the participants will most likely not have mirror image abilities in both their languages.

This study should proceed until the participants have achieved an advanced level of linguistic development (MLU 5 and beyond). This would permit the effects of developmental and performance factors to be assessed.

While many aspects of bilingual language acquisition have been studied, it is clear that more research needs to be done on specific areas, such as *pro-drop*. This type of research could help support various theories regarding both bilingual language acquisition and syntactic development.

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Multiple wh-movement and Superiority Effects in Czech

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Abstract

This paper examines multiple wh-movement in Czech. Rudin (1988) argues that Czech is a [-Multiply Filled Spec, CP] language in which only one wh-word appears in Spec,CP while the rest are IP-adjoined. It is argued that [-MFS] languages do not exhibit Superiority; however, recent research has shown Superiority to obtain in other [-MFS] languages such as Serbo-Croatian and Russian. I apply this research to Czech data to see if Superiority can be shown to account for the ordering of the multiply fronted wh-words. I conclude by showing that multiple wh-word order in Czech cannot be accounted for solely by the syntax. Rather, it is the complex relationship between syntactic and discursal factors that determines wh-word order in Czech.

1.0 Introduction

In many Slavic languages such as Czech, Polish, Russian and Bulgarian, all wh-words are moved to clause initial position at S-structure. In an influential 1988 paper, Rudin proposed two distinct, parameterized types based on the landing site of the multiple fronted wh-phrases: [+Multiply filled Spec, CP] and [-Multiply filled Spec, CP]. The two types exhibit systematic differences in regards to clitic placement, wh-islands, wh-extraction and ordering constraints. Czech, along with Polish and Serbo-Croatian, is classified as [-Multiply filled Spec, CP], which means that only one of the wh-words is in Spec of CP while the others are adjoined to IP. The wh-words therefore do not form a constituent. This is contrasted to [+Multiply filled Spec, CP] languages such as Bulgarian and Romanian in which all wh-phrases are in Spec, CP at S-structure. The two types of languages are diametrically opposed with regard to clitic placement, wh-islands, wh-extraction and ordering constraints, which can be accounted for by a parametrized Condition on Spec, CP adjunction prohibiting adjunction at different levels of the grammar.

Under Rudin's theory, only [+MFS] languages are thought to be subject to the Superiority Condition. However, recent research has shown that Superiority also constrains multiple wh-movement under certain conditions in the [-MFS] languages Russian and Serbo-Croatian. An obvious direction of research, then, is to investigate whether Superiority effects can be found in the remaining [-MFS]

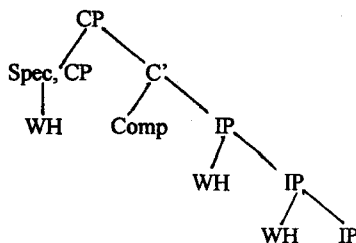
languages such as Czech, and whether the Superiority Condition can be argued as a part of the Universal Grammar. With this in mind, this paper will investigate d(iscourse)-linking and its effects on the exhibition of the Superiority Condition in Czech.

In Section 2, I review the Multiply Filled Spec, CP Parameter and its implications for several parameterized language behaviors in multiple wh-fronting languages. Section 3 investigates the behaviors of [-Multiply Filled Spec, CP] languages in general and of Czech specifically. In Section 4 I will discuss the Multiply Filled Spec Parameter in relation to the Superiority Condition. Sections 5 and 6 deal with Bošković's (1997) arguments regarding Superiority Effects in Serbo-Croatian. In Section 7 I will compare Bošković's findings for Superiority in Serbo-Croatian with parallel data in Czech with an eye to seeing if the Superiority findings in Serbo-Croatian hold for the Czech data. Finally, Section 8 discusses d(iscourse)-linked multiple wh-movement and how it can account for the apparent absence of Superiority Effects in Czech.

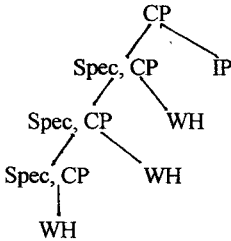
2.0 The Multiply Filled Spec, CP Parameter

According to Rudin, languages allowing multiple wh-fronting at S-structure can be neatly subdivided into two groups based on the landing sites of the multiple fronted wh-phrases. She calls this the Multiply Filled Spec, CP parameter: languages allowing multiple wh-fronting are either [-MFS] and have one wh-phrase in Spec, CP with all others adjoined to IP; or they are [+MFS] and have all wh-phrases in Spec, CP. The corresponding tree structures can be seen, respectively, in (1) and (2):

- (1) [-Multiply Filled Spec, CP] [CP_{Spec, CP} WH] [IP WH WH...]]



(2) [+Multiply Filled Spec, CP] [CP[Spec, CP WH WH WH][IP.....]]



This assumption that [-MFS] and [+MFS] languages differ in their S-structures allows Rudin to explain systematic differences in behaviors with respect to wh-violations, multiple wh-extraction from a clause, the position of clitics, adverbs and parentheticals within a sentence, and the strictness of ordering of multiple fronted wh-words. The behaviors are summarized in Table 1 below, which neatly demonstrates the clear subdivision of [-MFS] and [+MFS] languages.

Table 1

	[+ MFS] LANGUAGES		[- MFS] LANGUAGES		
	BULGARIAN	ROMANIAN	CZECH	POLISH	SERBO-CROATIAN
WH-island violations	+	+	-	-	-
Multiple WH-extraction from a clause	+	+	-	-	-
free NOM/ ACC word order	-	-	+	+	+
2 nd position clitics	-	-	+	+	+
adverbs follow first WH	-	-	+	+	+

Rudin accounts for the differing behaviors of [-MFS] and [+MFS] languages by a Condition on Spec, CP Adjunction:

(3) *Condition on Spec, CP Adjunction*

* [_{Spec, CP} Spec, CP]

(Nothing may be adjoined to Spec, CP at level X of the grammar)

This condition prohibits adjunction at different levels of the grammar. By positing such a condition, Rudin accounts for the parameter specific behaviors. Since [+MFS] languages permit adjunction to Spec, CP at S-structure, more than one wh-phrase can pass through this position and these languages thus permit wh-island violations and multiple wh-extraction from a clause. In these languages, the placement of clitics and adverbs following the entire wh-series indicates that the wh-words are acting as a constituent. The opposite holds true of [-MFS] languages which prohibit adjunction to Spec of CP and thereby disallow wh-island violations and multiple wh-phrase extraction. The [-MFS] languages place clitics and adverbs following the first wh-word thereby indicating that the words are not acting as a unit. In the next section we will see how Czech fits into the schema of [-MFS] languages.

3.0 Czech as a [-Multiply Filled Spec, CP] language

As noted in Table 1, Czech belongs to the [-MFS] group of languages which have a single wh-phrase in Spec, CP while the rest are adjoined to IP. This S-structure for [-MFS] languages has implications for language behaviors which I will overview in this section.

3.1 Wh-island violations

Given that [+MFS] languages have more than one wh-word in Spec, CP, it is expected that they will not be subject to wh-island constraints since a wh-word is not blocked from moving through the Spec, CP. Conversely, we would expect that [-MFS] languages would have wh-island constraints. This expectation holds true for Czech; neither questioning nor relativization is possible from inside a wh-question as in examples (4a,b):

(4) a. **Kdo se tě ptal co dělá?**

Who have.3P you asked what does

'Who did they ask you what he does?'

b. **To je ten, kdo jsem ti řekl, co dělá.**

That is the one who have.1S you told what does

'That is the person who I asked you what he does.'

3.2 Multiple wh-extraction from a clause

Because only one wh-phrase can move through or leave a trace in the Spec of CP, [-MFS] languages do not allow multiple wh-extraction from a clause. Czech allows extraction of only one wh-word from a clause. Long distance movement of more than one wh-word from a clause is ungrammatical as in (5b):

- (5) a. **Kde** si myslíš, že budeme spat?
Where refl think.2SG that will.1PL sleep
'Where do you think that we will sleep?'
- b. ***Kde kdy** si myslíš, že budeme spat?
Where when refl think.2SG that will.1PL sleep
'Where do you think we will sleep when?'

In sentence (5a), there is only one wh-phrase and the sentence is grammatical; example (5b) has two wh-phrases extracted from a clause and the sentence is ungrammatical. This is a result of the Condition on Spec, CP Adjunction, which disallows adjunction to Spec, CP in [-MFS] languages at S-structure.

3.3. Nominative/Accusative Word Order

Whether a multiple wh-fronting language allows free wh-word order is also related to the posited S-structure for [-MFS] and [+MFS] languages. In [+MFS] languages, the order of the fronted wh-words is relatively fixed, which is argued as a function of the Superiority Condition. In [-MFS] languages however, the word order is relatively free. All three of the Czech examples below are fully grammatical; in a [+MFS] language we would expect only a nominative/accusative word order as in (6a) to be grammatical.

- (6) a. **Kdo kdy koho** pozval, nevím.
Who when whom invited not-know.ISG
'Who invited whom when, I don't know.'
- b. **Kdy kdo koho** pozval, nevím.
When who whom invited not-know.ISG
- c. **Koho kdy kdo** pozval, nevím
whom when who invited not-know.ISG

The difference in rigidity of word order can be attributed to the structural properties of [-MFS] and [+MFS] languages.

3.4 Clitic position

Clitic positions in [-MFS] and [+MFS] languages provide evidence for constituent patterns. In [+MFS] languages, a clitic is placed after the entire sequence of wh-words – it may not break up the series. In contrast, [-MFS] languages obligatorily place the clitic after the first wh-word. This can be related to their respective S-structures, in that [+MFS] languages place all wh-words in Spec, CP to form a constituent, while in [-MFS] languages the wh-words are not a constituent with only one wh-word in Spec, CP and the others adjoined to IP. Czech is especially rigid – clitics always follow the first major constituent of the clause:

- (7) a. Komu ho kdy dali, nikdo neví.
To whom him when gave.3P nobody knows
 'Nobody knows when they gave him to whom.'
- b. *Komu kdy ho dali, nikdo neví.
To whom when him gave.3P nobody knows

That clitics obligatorily follow the first wh-word as in (7a) supports the idea that the first wh-word forms a separate constituent and is alone in Spec, CP.

4.0 The Multiply Filled Spec Parameter and Superiority

The original claim made by Rudin regarding the Multiply Filled Spec Parameter and the Superiority Condition was that only [+MFS] languages are subject to the Superiority Condition. Adjunction to Spec, CP in [+MFS] is rightwards so that ordering of fronted WH-phrases follows from Superiority. In contrast, free ordering of wh-words in [-MFS] languages appears to indicate that they are exempt from Superiority. Chomsky's 1973 formulation of the Superiority Condition states that:

- (8) *The Superiority Condition*
- (a). No rule can involve X, Y in the structure
 ... X ... [...Z ... WYV...]...
 where the rule applies ambiguously to Z and Y,
 and Z is superior to Y.

- (b) the category A is 'superior' to category B if every major category dominating A dominates B as well but not conversely.

If the Superiority Condition were to hold in [-MFS] languages, then we would expect to find the first wh-phrase has moved to Spec, CP in multiple fronted wh-questions; where this does not occur the sentence should be ungrammatical. As we can see in from the Polish examples below this does not obtain:

- (9) a. **Kogo** **komu** przedstawites?
Who to whom introduced.2S
 'Who did you introduce to whom?'
 b. **Komu** **kogo** przedstawites?
To whom who introduced.2S

In example (9b) the direct object wh-phrase has moved to Spec, CP before the subject wh-phrase. Under the Superiority Condition, this example would be predicted to be ungrammatical. That it is not indicates that the Superiority Condition does not apply.

Upon closer investigation of Rudin's claims, Bošković (1997) argued that wh-word order in Serbo-Croatian (a [-MFS] language) is subject to ordering constraints under certain conditions. These conditions were not examined by Rudin. Karpacheva (1997) has also indicated Superiority effects for Russian, a [-MFS] language. In the next sections, I will examine Bošković's findings for Serbo-Croatian and then compare the findings to Czech data to see if Superiority can be shown to obtain in Czech as well.

5.0 Superiority Effects in Serbo-Croatian

In his 1997 paper entitled "Superiority effects with multiple wh-fronting in Serbo-Croatian", Bošković argues that Serbo-Croatian does in fact show ordering constraints of multiple fronted wh-words in certain contexts not discussed by Rudin. He holds that these ordering constraints are due to the Superiority Condition. Bošković further argues that because the Superiority Condition follows from Principles of Economy, it should not be a candidate for cross-linguistic variation. It is therefore desirable to show that Superiority Effects do obtain in [-MFS] languages, contrary to Rudin's claims. In the following

sections, I review the data that led Bošković to argue that Superiority does apply in Serbo-Croatian. Later sections will apply the analysis to Czech.

5.1 Long-distance wh-extraction

Upon examination of the data used in Rudin (1998b), Bošković found that the arguments for Serbo-Croatian and Superiority held with respect to constructions involving multiple short distance extraction of wh-words, but not for multiple long distance extraction of wh-words. That is, Rudin examined short-distance wh-extraction and found that word ordering was free in these constructions indicating no Superiority effects. Her data did not include long distance extractions. It is in these constructions that Bošković finds restricted word order and evidence for Superiority:

- (10) a. **Ko** si koga tvrdio da je istukao?
Who are whom claimed that is beaten
'Who did you claim beat whom?'
- b. ***Koga** si ko tvrdio da je istukao?

Examples (10 a,b) parallel the [+MFS] languages which have relatively restricted word order and are subject to Superiority. In (10a) the subject wh-phrase undergoes movement while the object adjoins to IP and the sentence is grammatical. In ungrammatical (10b) the reverse holds: the object wh-phrase has undergone movement and the subject has adjoined to IP. Superiority effects are exhibited.

5.2 Correlative Questions and the Superiority Condition

A second construction noted by Bošković in which superiority applies in Serbo-Croatian is in embedded questions, specifically in correlative constructions.¹ Bošković shows that the ordering of wh-words in correlative constructions is not free, thus indicating a Superiority effect as seen in the examples below:

¹ Bošković examines correlative constructions rather than embedded questions as the latter may have an adsentential + root clause analysis and thus no definite conclusions could be drawn. For his purposes, correlative constructions have all the formal properties of questions.

- (11) a. [Ko koga voli], taj o njemu govori.
Who whom loves that-one about him talks
 'Everyone talks about the person they love.'
- b. *[Koga ko voli], taj o njemu govori.

Again we see that in certain constructions ordering and therefore Superiority can be shown to apply in Serbo-Croatian. The question remains, however, as to why it should apply only in long distance questions and correlative questions, but not in short-distance matrix questions. The next section examines Bošković's account of the Superiority facts in Serbo-Croatian by comparison with peculiarities in French wh-movement.

6.0 Wh-movement in French and Superiority Effects in Serbo-Croatian

To account for the division in Superiority Effects in Serbo-Croatian, Bošković compared his findings to a similar phenomenon in French. He noted that where Serbo-Croatian does not show Superiority Effects, wh-movement is optional in French. Recall that in Serbo-Croatian short distance matrix questions, wh-word order is free and Superiority does not apply. In French, overt wh-movement need not take place in short distance matrix questions as we see in (12):

- (12) a. Tu as vendu quoi?
You have sold what
 'What did you sell?'

Conversely, where Superiority Effects apply in Serbo-Croatian, wh-movement in French is obligatory. Where a finite clause boundary separates the base generated wh-position from the landing site, movement must take place in French:

- (13) a. *Jean et Marie croient que Pierre a embrassé qui?
John and Mary believe that Peter has kissed who
 'Who do John and Mary believe that Peter has kissed?'
- b. Qui Jean et Marie croient-ils que Pierre a embrassé?

As in Serbo-Croatian, movement must take place in French in embedded questions for the sentence to be grammatical:

- (14) a. *Pierre a demandé tu as embrassé qui.
 Peter has asked you have kissed who
 ‘Peter asked who you kissed.’
 b. Pierre a demandé qui tu as embrassé.

In (13) and (14), wh-movement must take place in French; these examples parallel the contexts in Serbo-Croatian in which Superiority Effects hold.

Under Rudin’s analysis, in [-MFS] languages such as Serbo-Croatian the first wh-phrase is located in Spec, CP while the other wh-words are adjoined to IP. Bošković argues that in short distance matrix questions in Serbo-Croatian (where Superiority does not seem to apply), no wh-phrase moves to Spec, CP and that all preposed wh-phrases are adjoined to IP. The difference between French and Serbo-Croatian short distance matrix questions is that in Serbo-Croatian the wh-phrases must still move overtly; in French they need not do so. The unusual Superiority effects in Serbo-Croatian can be schematized as follows:

- i. long distance extraction and embedded questions exhibit Superiority effects because they involve wh-movement
- ii. short distance extraction questions do not exhibit Superiority effects with wh-movement because they do not involve wh-movement

7.0 Czech and Serbo-Croatian

In light of recent research showing Superiority effects in other [-MFS] languages such as Serbo-Croatian and Russian, it would be interesting to see if these findings can be found for the remaining [-MFS] languages, specifically Czech. To this end, I compared the Serbo-Croatian data used by Bošković with their Czech counterparts. In the following sections I discuss relevant Czech data, followed by an analysis and possible explanation.

7.1 Long distance extraction in Czech²

As seen in Section (3.2), in long distance wh-movement only one wh-word may be fronted. Further, Czech differs from other [-MFS] languages in that only Czech permits extraction from tensed clauses. Under the Superiority Condition, we would predict that only those sentences in which the Subject is fronted to

² I thank Radan Novák for providing native speaker judgements.

Spec, CP while the object remains in-situ should be grammatical. Examples (15a,b) show that this is not so:

- (15) a. **Kdo**, si myslíš, že **na koho** čekal?
Who refl think.2SG that for whom waiting.past
 ‘Who do you think was waiting for whom?’
- b. **Na koho** si myslíš, že **kdo** čekal?

In example (15a) the subject wh-word is fronted to Spec, CP and the sentence is grammatical. However, in (15b), the object wh-word has fronted – thus violating Superiority – yet the sentence is grammatical. As we saw in Section 2, [-MFS] languages front one wh-word to Spec, CP and the rest are adjoined to IP.

This relatively free word order also applies between a subject and an adjunct. Under Superiority, we would predict that Subject movement should take place before adjunct movement. As we see in (16), this does not hold in Czech:

- (16) a. **Kdo** si myslíš, že odešli **kdy**?
Who refl think.2SG that left when
 ‘Who do you think left when?’
- b. **Kdy** si myslíš, že odešli **kdo**?

Either the subject wh-word or the adjunct wh-word may be fronted; both constructions are grammatical. In the following section I discuss Correlative questions in Czech.³

7.2 Correlative Questions

Recall from the Serbo-Croatian data in Section 5.2 that correlative questions in Serbo-Croatian do exhibit Superiority Effects. This does not, however, appear to be the case in Czech:

- (17) a. **Kdo** si **koho** bojí, tak o něm mluví.
Who refl whom afraid.3SG that about him speak.3SG
 ‘Everyone talks about the person they are afraid of.’

³ I analyzed correlative constructions to keep the Czech data in line with the Serbo-Croatian used by Bošković. Embedded questions could also be used for this purpose.

- b. **Koho si kdo bojí, tak o něm mluví.**

The examples in (17a,b) are both grammatical regardless of whether a Subject or an Object wh-word is first fronted. Czech permits free wh-word order in correlative constructions.

I conclude then, that Czech does not appear to pattern like Serbo-Croatian with respect to the Superiority Condition either in long-distance wh-extraction or correlative questions. Neither is Czech subject to Superiority constraints in the short distance matrix clauses originally analyzed by Rudin. The question remains – is Czech subject to Superiority effects in any configuration? In the following sections I discuss discourse-linked (d-linked) readings to see if they can account for the Czech facts.

8.0 Discourse-linked wh-movement

My analysis of multiple wh-movement thus far has concentrated solely on wh-word ordering as determined by the syntax. However, evidence shows that word order can be determined by non-syntactic factors as well, specifically discourse functions. In some cases, discourse may be the only factor determining word order. Wachowicz (1974) mentions studies by the linguists of the Prague school regarding apparent free word order in multiple wh-word fronting languages. She states:

- (18) A change in the word order often involves a change in the meaning of the sentence, that is, different orders are used in different contexts.

This observation concerning d-linked determination of word order has been made for multiple wh-moving languages by, among others, Wachowicz (1974), Pesetsky (1987) and Cheng (1991).

8.1 Clarifying Questions in Polish

Wachowicz discusses a phenomenon in Polish (also a [-MFS] language), which she calls clarifying, whereby only one wh-word moves to the beginning of a clause and the other remains in-situ (as opposed to the normal pattern in Polish where all wh-words are fronted). These clarifying questions cannot be interpreted as requests for information, rather, their function is to clarify a statement already present in the discourse. She gives as an example the question in (19):

- (19) W koncu, **kto** **robi** **co?**
finally, who does what
 'Finally, who's doing what?' (Wachowicz 1974)

In this marked word order, the speaker is asking for clarification in a pairing situation where each person is assigned one task from several. The speaker would like to clarify exactly who will be doing which task. Syntactically it is assumed that non d-linked wh-words move to an A-bar position at S-structure. D-linked wh-words need not move.

8.2 Which phrases

According to Pesetsky (1997), *which* phrases are inherently d-linked. Furthermore, *which* phrases do not show Superiority because no movement takes place. This is illustrated by the following examples from English:

- (20) a. *Which man_i did you persuade e_i to read which book?*
 b. *Which book_j did you persuade which man to read e_j?*
- (21) a. *Mary asked which man_i e_i read which book.*
 b. *Mary asked which book_j which man read e_j.*

In English, we would expect the (b) examples to be ungrammatical as they have fronted the object wh-phrase rather than the subject wh-phrase. In examples (20) and (21), both the (a) and (b) sentences are grammatical because they involve *which*-phrases which are not subject to Superiority. Either the subject or the object *which* phrase can move. Pesetsky argues that *which*-phrases are discourse-linked, while unmarked occurrences of *who* and *what* are not discourse linked. With *which*-phrases, the range of possible answers is restricted to a specific set that both the speaker and the hearer are aware of. In the multiple *which*-questions of (20) and (21), the range of answers is restricted to an assumed set of men and an assumed set of books previously established in the discourse. Without this context, the question is odd. This context linking is absent in *who* or *what* questions. We may ask someone *what book did you read* without having a particular set of books in mind: the wh-phrase is not d-linked. Non d-linked phrases undergo A-bar movement and are subject to the Superiority Condition.

In Czech, we find that if a question contains more than one *which* phrase it sounds better if only one of the *which* phrases has been fronted as in (22):

- (22) a. **Která holka koupila kterou knižku?**
which girl bought.3SGF which book
- b. **Kterou knižku koupila která holka?**

Either the subject or the object *which* phrase can be moved; both sentences are acceptable. Superiority does not apply. However, fronting both *which* phrases is questionable at best regardless of whether the subject or object *which*-phrase is fronted first :

- (23) a. **?Která holka kterou knižku koupila?**
Which girl which book bought.3SGF
- b. **?Kterou knižku která holka koupila?**

Pesetsky further argues that, if we can force a d-linked reading onto normally non d-linked wh-phrases such as *who* or *what*, we should expect Superiority effects to disappear. In support of this argument he offers the example in (24):

- (24) I know that we need to install transistor A, transistor B, and transistor C, and I know that these three holes are for transistors, but I'll be damned if I can figure out from the instructions where what goes!

In certain d-linked contexts, the adjunct phrase may move before the subject phrase and yet the sentence is fully grammatical. Superiority disappears if we force a d-linked reading on the wh-phrases. Only d-linked wh-words may move into the Topic position so that *which*-phrases can be topics, while *who* or *what* can be topics if forced by the context.⁴ (Erteschik-Shir, 1998 lecture)

The claim here is that non d-linked wh-phrases are assigned scope by movement at LF, while d-linked in-situ wh-phrases are assigned scope without movement. Scope of d-linked wh-phrases is assigned by unselective binding (following Heim's system of scope assignment to indefinite NPs). Unselective binders may bind more than one variable. Pesetsky is unclear as to why there should be a link between indefinites and d-linked wh-phrases. However, in her 1991 dissertation Cheng makes a coherent, convincing argument for wh-words as indefinite NPs.

⁴ It would be interesting and informative to look at the data from Focus Structure Program perspective, however, it is beyond the scope of this paper.

In the next section I will briefly summarize her analysis; however, a detailed review is far beyond the scope of this paper.

8.3 Wh-words and indefinites

Cheng argues that bare wh-words in multiple fronting wh-languages such as Czech are similar to indefinites in that they lack inherent quantificational force. This relation is clearly illustrated by the fact that the bare wh-words in multiple wh-fronting languages are used to form indefinite NPs by attaching a particle. Below is the paradigm for Czech:

Table 2
Czech Wh-words /Indefinite NP paradigm

kdo	<i>who</i>	někdo	<i>someone</i>
kde	<i>where</i>	někde	<i>somewhere</i>
kdy	<i>when</i>	někdy	<i>sometime</i>
jaký	<i>what sort of</i>	nějaký	<i>some sort of</i>

In Czech, the prefix *ně-* is attached to the bare wh-word to form an indefinite NP. Cheng's analysis is that the interrogative force of the bare wh-words in these languages is determined by a null determiner [$D\emptyset_{[+wh]}$], which needs to be licensed by a feature matching with a [+wh] at S-structure, thus accounting for their movement. The variable introduced by the wh-words must be bound by other elements in the sentence and can thus vary with context. Following Pesetsky, Cheng argues that d-linked wh-phrases are not quantifiers; they do not therefore move to A-bar position.⁵ In d-linked wh-phrases only what Cheng calls the *core* is present. This *core* lacks inherent quantificational force. When the non-quantificational *core* appears, we have a d-linked reading of the wh-word. Keeping in mind the argument that only A-bar positions are subject to Superiority effects, it then follows that d-linked wh-phrases are not subject to Superiority because they are not in A-bar positions.

If we argue that wh-words must be in Spec, CP to be d-linked (other than *which*, which is inherently d-linked), we can assume that the wh-word in Spec, CP at S-Structure is d-linked and can be any one of the multiply fronted wh-words depending on the intention of the speaker. (This was intuitively captured by my native speaker informants, who often mentioned that their choice of word order

⁵ Cheng proposes a post LF level at which d-linked wh-phrases move. I will not discuss this here.

was determined by what they wanted to emphasize or question.) The other wh-words adjoin to IP in [-MFS] languages such as Czech as stated by Rudin. The fact that Czech can front wh-words in any order simply indicates that Superiority constrains movement to Spec, but not adjunction. In [-MFS] languages wh-movement is adjunction to IP and may be A-movement if it is sufficiently local as in the short distance matrix questions analyzed by Rudin. Lack of Superiority Effects for short distance movement follows. Further research is need on the intricate relationship between syntactic and discorsal factors in determining wh-word order in multiple wh-fronting languages.

9.0 Conclusion

In this paper I have discussed multiple wh-fronting in Czech. The first part of my analysis was based on Rudin's division of multiply wh-fronting languages into two distinct, parameterized types based on the landing site of the multiple fronted wh-phrases, and the classification of Czech as a [-Multiply Filled Spec, CP] language. I then discussed Bošković's findings for another [-MFS] language, Serbo-Croatian, and his argument that Superiority effects are exhibited in certain constructions not examined by Rudin. From this, I analysed parallel Czech data; Superiority was not found to hold in the same constructions as Bošković argued for Serbo-Croatian. This does not, however, mean that Superiority is not a factor in Czech. If we assume that the word order can be influenced by non-syntactic factors such as discourse functions, it is found that Superiority disappears if we assume a d-linked reading on the wh-phrases. The Superiority Condition therefore applies only to non d-linked wh-words. In those constructions which are d-linked, we would not expect to find Superiority exhibited. Further research is needed on the complex relationship between syntactic and non-syntactic factors affecting wh-movement in both [+MFS] and [-MFS] languages.

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EVENT STRUCTURE AND SYNTAX: GERMAN*

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Abstract

This paper deals with the role of the lexicon versus the syntax in event structure by examining particle verb formation in German. There are two types of particles in German: Delimiting particles, which derive accomplishments or activities from activity base verbs, and nondelimiting ones, which leave the aspectual class of the base verb (activity) unchanged.

A theory such as Ritter & Rosen (1998, to appear), which explicitly represents event structure in the syntax (e.g., through an FP-delimitation) is not able to account for the German facts, as it cannot explain the uniform morphosyntactic behavior of all particles.

An analysis which combines syntactic structure (VP-shells, following Hale & Keyser (1994), Chomsky (1995)) and lexical features is adapted. It treats particles as heads of an empty PP in the lower VP. Delimiting particles are distinguished from nondelimiting ones through a lexical feature [+delim]. This analysis is also successful in providing homogeneous case-marking for all internal arguments. It questions Ritter & Rosen's purely syntactic analysis of event structure, where delimitation is assumed to be a grammatical primitive.

1. Introduction

Exactly to what extent the syntax versus the lexicon is responsible for the meaning of a sentence is a long-standing question in linguistics. Traditionally, the lexicon has been seen as the major factor, not only storing word meaning, but also determining much of a sentence's basic meaning (and structure). This is especially so for the interpretation of arguments where the syntax, or at least syntactic operations, were thought to be semantically neutral. The "autonomy of syntax" with respect to argument interpretation is expressed in the Principles & Parameters framework as Theta Theory (Chomsky 1981) and, for example, as the "Uniformity of Theta Assignment Hypothesis" (Baker 1988).

More recently, there has been a growing body of literature in generative grammar pointing out that compositional—and hence syntactic—factors are often involved in determining the meaning of a sentence. For example, Tenny (1992) shows the role of the internal argument in determining whether a sentence refers to an open-ended event or to an event delimited in time:

- (1) a. Charles drank a **mug of beer** (??for an hour/in an hour).
b. Charles drank **beer** (for an hour/*in an hour). (Tenny 1992:7)

Describing these meaning differences in terms of lexical verb meaning alone is difficult: One would have to posit two homophonous (or one polysemous) verb(s) *drink*. Since in both cases the internal argument bears the theta role "theme", it is hard to see how the lexicon could "know" which meaning should occur with which kind of theme. Therefore, such compositionally created differences in event structure are better dealt with in the syntax than in the lexicon.

In fact, such observations about event structure are not new: They probably go back all the way to Aristotle, and have been described in this century, among others, by Vendler (1967) and Dowty (1979, 1991). However, attempts to formalize these observations in terms of Principles & Parameters Theory or Minimalism are fairly recent, e.g., Borer (1994), Ritter & Rosen (1998, to appear).

In this paper, I will attempt to provide a syntactic account of event structure. I will analyze data from German, in particular the alternations in event structure between simple and

particle verbs, and the role of these verbs' internal arguments. To my knowledge, a syntactic analysis of event structure has not yet been attempted for German. There are lexical analyses of German particle verbs (e.g., Wunderlich 1997, Stiebels & Wunderlich 1994), as well as (morpho-)syntactic analyses of Dutch particles (e.g., Hoekstra 1988, Neeleman & Weerman 1993), but none of these have explicitly addressed the effects of particles, let alone internal arguments, on event structure.

The paper is organized as follows: In section 2, I will give a detailed description of the event structure of some German verbs. In section 3, I will apply Ritter & Rosen's theory to the German data, and discuss the limitations of this theory. In section 4, I will examine whether the approach by Hale & Keyser (1991, 1994) can be modified to account for the German data, and in section 5, I will summarize the insights provided into German, and evaluate the two syntactic approaches to event structure.

2.0. The event structure of German verbs

In German, events expressed by simple verbs can be delimited in at least two ways which lend themselves to a syntactic analysis: (i) through an internal argument, and (ii) through a delimiting particle, which is separable from the verb.¹ Before describing the data, however, I will briefly introduce the classification of verbs into "aspectual classes" based on Vendler (1967) and Dowty (1979).

2.1. Aspectual classes

Vendler (1967) and Dowty (1979) divide (English) verbs into four aspectual classes, depending on "their restrictions on time adverbials, tenses, and logical entailments" (Dowty 1979:54). This classification has become the one most commonly used in syntactic and semantic theory, and so I will adopt it here. The four classes of verbs are as follows:

- (2) a. States: *know, be ignorant, own, desire*
- b. Activities: *walk, play, drive a car, discuss*
- c. Accomplishments: *kill, build a house, draw a circle, break*
- d. Achievements: *die, recognize a face, reach the summit, find*

States are not really events at all; they have no beginning and no endpoint. Activities have a beginning, but they are open-ended. They usually involve agency or volition by the one performing the activity, while states do not. Accomplishments have an initiation point as well as an endpoint. They take a certain (long or short) time to be completed, and are not completed before this time has elapsed. Achievements, finally, have only an endpoint, and they are only really "achieved" in that final instant (even though a related process/activity may have been going on in order to reach this end), usually without volition/agency.

Based on these characteristics, Vendler and Dowty have developed a set of criteria or tests to divide verbs into the four classes. The following is a list of those of their criteria that I have used in the classification of German verbs:

(3)

Activities (e.g., <i>run</i>)	States (e.g., <i>know</i>)
<ul style="list-style-type: none">• run <i>for an hour</i>• <i>spend an hour</i> running• *run <i>in an hour</i>• *take <i>an hour to</i> run• 'X is running' entails 'X has run'• 'run for an hour' entails 'run at all times in the hour'• 'X almost ran': X never even started to run• *X <i>finished</i> running	<ul style="list-style-type: none">• no progressive : *X is knowing• bad with <i>deliberately/ carefully/ attentively</i>• no imperative : *Know!• *know <i>in an hour</i>
Accomplishments (e.g., <i>build a house</i>)	Achievements (e.g., <i>find the key</i>)
<ul style="list-style-type: none">• build a house <i>in an hour</i>• take <i>an hour to</i> build a house• 'X is building a house' does not entail 'X has built a house'• 'X almost built a house': X never started building, or X started but did not finish• X <i>finished</i> building a house• 'X built a house in an hour' entails 'X was building a house during that hour'	<ul style="list-style-type: none">• bad with <i>deliberately/ carefully/attentively</i>• *find the key <i>for an hour</i>• *spend <i>an hour</i> finding the key• 'X almost found the key': X never did find the key• *X <i>finished</i> finding the key• 'X found the key in an hour' does not entail 'X was finding the key during that hour'

I will now proceed to show the effect of particles and internal arguments on the aspectual class of German verbs. Due to limited space, I will only show one aspectual class test for each verb.

2.2. The internal argument and event structure

As noted above, the internal argument is involved in delimiting events in many languages. This is also true for German. In particular, specific² internal arguments (most DPs with an overt article) serve to delimit an event, while non-specific internal arguments (bare mass nouns & bare plurals, thus bare NPs) do not:

- (4) a. Sie diskutierten (eine Stunde lang/*in einer Stunde).
They were discussing (for an hour/*in an hour).
b. Sie diskutierten **das Problem** (eine Stunde lang/in einer Stunde).
They discussed **the problem** (for an hour/in an hour).
c. Sie diskutierten (eine Stunde lang/*in einer Stunde) **Probleme**.
They were discussing **problems** (for an hour/*in an hour).
- (5) a. Karin las (eine Stunde lang/*in einer Stunde).
Karin read (for an hour/*in an hour).
b. Karin las **den Roman** (eine Stunde lang/in einer Stunde).
Karin read **the novel** (for an hour/in an hour).
c. Karin las (eine Stunde lang/*in einer Stunde) **Romane**.
Karin read **novels** (for an hour/*in an hour).

- (6) a. Sie wusch (eine Stunde lang/*in einer Stunde).
She was washing (for an hour/*in an hour).
b. Sie wusch ihr Auto (eine Stunde lang/in einer Stunde).
She washed her car (for an hour/in an hour).
c. Sie wusch (eine Stunde lang/*in einer Stunde) Autos/Besteck.
She washed cars/cutlery (for an hour/*in an hour).

The verbs in (4)–(6) usually refer to activities. This can be seen in the (a) examples, where they occur without internal argument, and in the (c) examples, where they occur with a nonspecific direct object. In the (b) examples, they occur with a specific direct object, and as a consequence, the event can be interpreted either as an activity or as an accomplishment. (Which interpretation obtains depends on the wider context, i.e. on the discourse.)

It seems, then, that specific direct objects serve to delimit an event. Since the verbs they interact with in (4)–(6) are nondelimited, the (optional) delimiting effect must be caused by the direct object DPs.

Let us now turn to examples of verbs which are usually thought of as accomplishments, and examine the role of the internal argument. Interestingly, these are all transitive verbs:

- (7) a. *Er ermordete.
(he murdered)
b. Er ermordete den Nachbarn (??eine Stunde lang/in einer Stunde).
He murdered the neighbor (??for an hour/in an hour).
c. ?Er ermordete (eine Stunde lang/*in einer Stunde) Nachbarn.
He murdered neighbors (for an hour/*in an hour).
- (8) a. *Sie leerte.
(she emptied)
b. Sie leerte eine Flasche (*eine Stunde lang/in einer Stunde).
She emptied a bottle (*for an hour/in an hour).
c. ?Sie leerte (eine Stunde lang/*in einer Stunde) Flaschen.
She emptied bottles (for an hour/*in an hour).

Accomplishment verbs such as in (7) and (8) usually occur with a specific direct object. The (c) examples with a nonspecific object are somewhat marked (pragmatically); they refer to conceivable, but unusual situations: Someone engaged in the activity of emptying many bottles, or of murdering many neighbors. Since 'bottles' and 'neighbors' are bare plurals, i.e. nonspecific, no endpoint to the activity is expressed, and the event consists of an unbounded iteration of accomplishments.

- (9) 'empty bottles': an activity with internal structure
* -- empty bottle1 -- empty bottle2 -- empty bottle3 --
initiation point (no endpoint)

To sum up, the (c) examples serve to show that, once the object is not specific, the delimitation reading becomes embedded in an (iterative) activity reading. This indicates that nonspecific internal arguments cannot or must not indicate delimitation. Event delimitation seems to be possible with specific direct objects only. Finally, the delimitation effect of specific internal arguments interacts with the nondelimitation of activity verbs, resulting in ambiguous constructions, where the context is needed in order to decide which type of event structure obtains.

Interestingly, it is not easy to find simple accomplishment verbs in German. Most of the accomplishment (and obligatorily transitive) verbs are either particle or prefix verbs. This brings us to the second way of delimiting events in German, particle verb formation.

2.3. Delimiting particles

In addition to simple verbs, German has two very productive types of complex verbs: Particle verbs and prefix verbs. Prefix verbs consist of the base verb plus an inseparable prefix, which is homophonous with a preposition or historically derived from one. Particle verbs consist of the base verb plus a separable particle:

- (10) a. (daß) sie das Problem **ausdiskutieren**
(that) they the problem **PT-discuss**
'(that) they completely discuss ('out-discuss') the problem'
b. sie **diskutieren** das Problem **aus**
they discuss the problem **PT**
'they completely discuss the problem'
c. **aus** dem Fenster/Wald/Buch
out the-DAT window/fridge/book
'out of the window/fridge/book'

In (10), the base verb *diskutieren* 'discuss' is combined with the particle *aus* 'out'. While the particle usually is adjacent to the verb, it is "stranded" at the end of the sentence in finite matrix clauses where the verb raises to the typical V2 position. Particles can be derived from (and are homophonous with) a preposition (cf. (10c)), an adverb, or, less productively, an adjective, verb or noun. It would be beyond the scope of this paper to discuss all types of particles, so I will limit my discussion to those homophonous with prepositions.

It has sometimes been claimed that the "aspectual affixation" in German is "unsystematic" (e.g., François 1985), but upon careful analysis, I do not find this to be the case for particles. There seem to be two kinds of particles, those which delimit (cause an event to have an endpoint), and those which do not have any effect on event structure.

Let us first look at examples of delimiting particles. There are two aspectual classes of verbs which have no endpoint: activities and states. Activities and states therefore provide a good testing-ground for the effects of particles: If, through combination with a particle, these types of verbs become delimited, that particle must have a delimiting function.

2.3.1. Accomplishments

In many instances, a base verb denotes an activity (agency/initiation and no endpoint, (a) examples below), while the corresponding particle verb denotes an accomplishment (agency/initiation plus endpoint, (c) examples):

- (11) a. Sie diskutierten (eine Stunde lang/*in einer Stunde).
They were discussing (for an hour/*in an hour).
b. Sie diskutierten (eine Stunde lang/in einer Stunde) ein Problem.
They discussed (for an hour/in an hour) a problem.
c. Sie diskutierten ein Problem (?eine Stunde lang/in einer Stunde) **aus**.
They completely discussed ('out-discussed') a problem (?for an hour/in an hour).
- (12) a. Sie las (eine Stunde lang/*in einer Stunde).
She was reading (for an hour/*in an hour).
b. Sie las den Roman (eine Stunde lang/in einer Stunde).
She read the novel (for an hour/in an hour).
c. Sie las den Roman (*eine Stunde lang/in einer Stunde) **aus**.³
She finished reading ('read out') the novel (*for an hour/in an hour).

- (13) a. Sie wusch (eine Stunde lang/*in einer Stunde).
She was washing (for an hour/*in an hour).
b. Sie wusch ihr Auto (eine Stunde lang/in einer Stunde).
She washed her car (for an hour/in an hour).
c. Sie wusch ihr Auto (?eine Stunde lang/in einer Stunde) ab.
She washed her car down ('off') (?for an hour/in an hour).
- (14) a. Sie aßen (eine Stunde lang/*in einer Stunde).
They ate (for an hour/*in an hour).
b. Sie aßen die Kekse (?eine Stunde lang/in einer Stunde).
They ate the cookies (?for an hour/in an hour).
c. Sie aßen die Kekse (*eine Stunde lang/in einer Stunde) auf.
They finished eating the cookies (for an hour/in an hour).

The specific DP also has a delimiting function, thus the (b) examples can be either accomplishments or activities, as explained above. However, once the particle is introduced, the sentences clearly denote accomplishments.

This delimiting effect of the particle can be counteracted by the presence of a non-specific object, as seen earlier in the case of other delimiting verbs (cf. (7) & (8) above):

- (15) a. ?Sie diskutierten (eine Stunde lang/*in einer Stunde) Probleme aus.
They completely discussed problems (for an hour/*in an hour).
b. ?Sie las (eine Stunde lang/*in einer Stunde) Romane aus.
She finished reading novels (for an hour/*in an hour).
c. Sie wusch (eine Stunde lang/*in einer Stunde) Autos/Besteck ab.
She washed off cars/cutlery for an hour/*in an hour.
d. ??Sie aßen (eine Stunde lang/*in einer Stunde) Kekse auf.
They ate up cookies (for an hour/*in an hour).

The facts in (15) do not mean that particles do not delimit, they simply show that the effect of the nonspecific NPs overrides the effect of the particles. In fact, the particle verbs in (15) behave exactly like other accomplishment verbs: They have to be transitive (unless there is an implied object), and their occurrence with nonspecific NPs is somewhat marked, even approaching ungrammaticality in (14d). Therefore, it seems safe to conclude that the particles *aus*, *auf* and *ab* have a delimiting function.

2.3.2. Achievements

So far, we have only looked at particles creating accomplishment verbs from activity base verbs. However, if particles can delimit, we would also expect examples of them deriving achievements, ideally from states, which both do not have an initiation point. There are indeed examples of achievement particle verbs:

- (16) a. Das Haus brannte (eine Stunde lang/*in einer Stunde).
The house was burning (for an hour/*in an hour).
b. Das Haus brannte (?eine Stunde lang/in einer Stunde) ab.
The house burnt down ('off') (?for an hour/in an hour).
- (17) a. Er dachte (eine Stunde lang/*in einer Stunde), daß er den Schlüssel verloren habe.
He thought (for an hour/in an hour) that he had lost the key.
b. Er dachte (?eine Stunde lang/in einer Stunde) um.
He changed his mind ('thought around') (?for an hour/in an hour).

- (18) a. Sie schlief (eine Stunde lang/*in einer Stunde).
She slept (for an hour/*in an hour).
b. Sie schlief (??eine Stunde lang??in einer Stunde) aus.
She slept enough/finished sleeping ('slept out') (??for an hour??in an hour).
c. Sie hatte (?eine Stunde lang/in einer Stunde) ausgeschlafen.
She had slept enough/had finished sleeping ('slept out') (?for an hour/in an hour).

The (a) examples have no endpoint. Once the particle is added, the events do have an endpoint, which is reached at the end of a 'process' indicated by the base verb. So, one could say (in German) that the house was burning for an hour, and at the end of the hour it was *abgebrannt* (burnt down), or somebody was thinking/sleeping for an hour, and at the end of that hour they had *umgedacht* (changed their mind) or *ausgeschlafen* (slept enough). Therefore, these particle verbs are achievement verbs. (18) is a particularly clear example: the particle verb requires perfective aspect in its more idiomatic use. Perfect, of course, indicates completion/delimitation (cf. footnote 1).

The function of particles in accomplishments versus achievements seems to be completely parallel: All the particle does is add an endpoint. Accomplishments are derived from (agentive) activity verbs, which share initiation. Since states and achievements pattern together in not having initiation, we would predict that achievements are derived from states (by adding a delimiting particle).

However, the picture is not so clear. Tests clearly show that the verbs in the (a) examples are nonagentive: They cannot occur with adverbs implying intention/volition (such as *absichtlich* 'deliberately', *aufmerksam* 'attentively'), and they are bad/odd in the imperative. But their aspectual class is ambiguous. They may be nonagentive activities rather than states. One piece of evidence for this is that they can occur in "progressive" aspect, expressed by *gerade* :

- (19) a. Das Haus brennt gerade.
'The house is burning (right now).'
- b. Er dachte gerade, daß er den Schlüssel verloren habe, als....
'He was thinking that he had lost the key, when...'
- c. Sie schlief gerade, als ...
'She was sleeping, when...'

In fact, while there are stative verbs in German (e.g., *wissen* 'know'), I find it impossible to find achievement verbs which are unambiguously derived from state base verbs. I conclude that the relevant distinction with respect to particle verb formation lies in agency: Agentive activities become accomplishments, nonagentive activities become achievements. In each case, the function of the particle is to provide an endpoint.

Incidentally, this distinction in terms of agency rather than stativeness is supported by Dowty (1979:180ff), who reclassifies accomplishments versus achievements into agentive versus nonagentive "definite changes of state". (For convenience, I will continue to refer to them as "accomplishments" and "achievements".)

The behavior of achievement verbs parallels that of accomplishments in another way: When the internal argument is non-specific, the delimitation is reduced or cancelled (cf. (15) above). Thus:

- (20) a. ??Häuser brannten (eine Stunde lang/*in einer Stunde) ab.
Houses were burning down (for an hour/*in an hour).
b. ??Politiker dachten (eine Stunde lang/*in einer Stunde) um.
Politicians changed their mind (for an hour/in an hour).
c. ??Studenten schliefen (eine Stunde lang/*in einer Stunde) aus.
Students slept enough/finished sleeping (for an hour/*in an hour).

These examples are quite marked, but to the extent that they are possible, there is no delimitation. There seems to be a stronger clash between the delimiting particle and the nondelimiting NP in achievements than in accomplishments, so that native speakers are uncertain as to how to interpret these sentences. Why should this be? It may have to do with the fact that subjects are topics, and bare plurals and mass nouns, being nonspecific, cannot be topics unless they are generic (cf. Cohen & Erteschik-Shir 1997). Since there is no context provided to suggest a generic interpretation (an existential⁴ interpretation is more accessible, but still difficult), the examples are almost ungrammatical. (Also see section 4.3. on topics.)

In summary, then, there are particles in German which clearly have a delimiting function. This is evident in their effect on agentive activity verbs, which become accomplishment verbs, and nonagentive activities, which become achievements.⁵ Stative verbs are not involved in particle verb formation. Delimiting particles in German seem to be *aus*, *um*, *ab*, *auf*, and probably *zu* and *durch*. While an examination of this claim in all occurrences of these particles is beyond the scope of this paper, such an analysis has been done for *um* by Benware (1993), who concludes that *um* is telic—delimiting—in all its uses.

2.4. Nondelimiting particles

In addition to delimiting particles, German has particles which never seem to affect a verb's aspectual class at all: *an*, *mit*, *über*, *nach*. Consider the following examples:

- (21) a. Sie lächelten (drei Stunden lang/*in drei Stunden). =
 Sie lächelten den Lehrer (drei Stunden lang/*in drei Stunden) an.
 'They smiled/smiled at the teacher (for three hours/*in three hours).'
- b. Sie rannten (drei Stunden lang/*in drei Stunden). =
 Sie rannten (drei Stunden lang/*in drei Stunden) mit.
 'They ran/ran along ('with') for three hours/*in three hours.'
- c. Das Wasser floß (drei Stunden lang/*in drei Stunden). =
 Das Wasser floß (drei Stunden lang/*in drei Stunden) über.
 'The water flowed/overflowed (for three hours/*in three hours).'
- d. Er schrie (drei Stunden lang/*in drei Stunden) =
 Er schrie (drei Stunden lang/*in drei Stunden) dem Pferd nach.
 'He yelled/yelled after the horse (for three hours/*in three hours).'
- e. Sie diskutierten (eine Stunde lang/*in einer Stunde). =
 Sie diskutierten das Problem (eine Stunde lang/*in einer Stunde) an.
 'They discussed/discussed the problem a bit (for an hour/*in an hour).'

Irrespective of whether there is a particle or not, these sentences refer to activities.⁶ However, other than the absence of the delimiting function, the particles in (19) exhibit the same morphosyntactic behavior as the delimiting particles (for example, same word order). This may pose a difficulty for a syntactic account of event structure, since one cannot simply assume different structural positions for the two types of particles.

Before we turn to the syntactic analyses of event structure in German, let's briefly summarize the facts discussed above:

- activity verbs serve as base verbs for particle verb formation, with a distinction in terms of agency
- some particles have a delimiting function, and are a major means of creating accomplishment or achievement verbs (from agentive versus nonagentive activity base verbs)
- some particles do not have a delimiting function
- accomplishment verbs are usually transitive
- specific internal arguments (DPs) serve to delimit an event, while nonspecific internal arguments (NPs/Ns) prevent delimitation

- the aspectual roles of the base verb, the particle and the internal argument interact with each other.

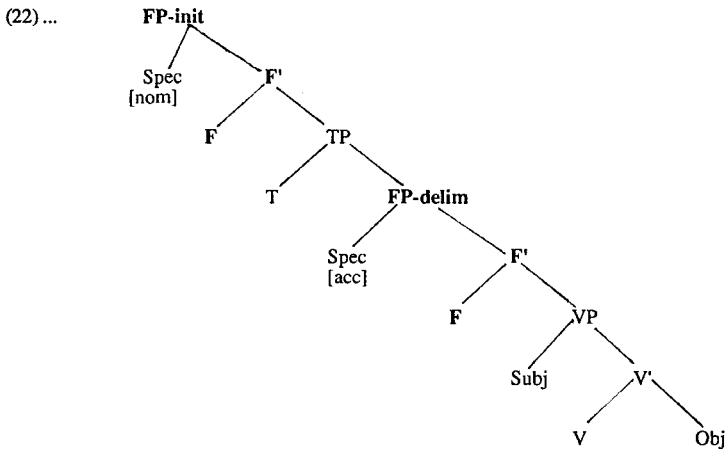
Any theory of event structure, whether lexical or syntactic, needs to account for these facts.

3.0. The syntax of event structure

Attempts at a formal syntactic account of event structure have been made by Borer (1994) and Ritter & Rosen (1998, to appear). In this section, I will evaluate the latter approach.

3.1. Ritter & Rosen's theory

Ritter & Rosen's basic idea is that event structure is compositionally (i.e., syntactically) determined by functional projections. They propose that the actual function of Agr-oP is to delimit events, and rename it FP-delimitation. Agr-sP is thought to be responsible for event initiation, and is called FP-initiation. They further propose that arguments identify initiation and/or delimitation by appearing in the specifier position of the respective FP:



Arguments in FP-delim receive structural accusative case, while arguments in FP-init receive structural nominative case.

Ritter & Rosen furthermore propose that there is parametric variation in how languages grammaticalize events. Some languages, called D-languages, grammaticalize the *terminal* bound of events, so that accomplishments and achievements are grouped together as events. Thus, in D-languages, it is the FP-delim which is responsible for an event reading: Accomplishments and achievements are identified through the presence of FP-delim. Once an FP-delim is present, an FP-init can also (but need not) be licensed. What is impossible in D-languages is the presence of an FP-init without an FP-delim. Since D-languages are based on FP-delim, they are predicted to be sensitive to semantic and syntactic properties of objects, or, more precisely, internal arguments, such as definiteness/specificity. This theory also predicts that structural accusative case may be restricted to delimiting objects in D-languages. Examples of D-languages are English, Finnish, and Chinese.

I-languages, on the other hand, rely on the initial bound for the grammaticalization of events, thus accomplishments are grouped with activities. Since the initial bound is encoded in FP-init, this projection is responsible for event readings in I-languages. FP-delim can only occur

if FP-init is present. As a consequence of this reliance on FP-init, I-languages are sensitive to semantic and syntactic properties of subjects (more precisely, external arguments), such as agentivity, animacy, and person of the subject. Icelandic, Irish, and Japanese are examples of I-languages.

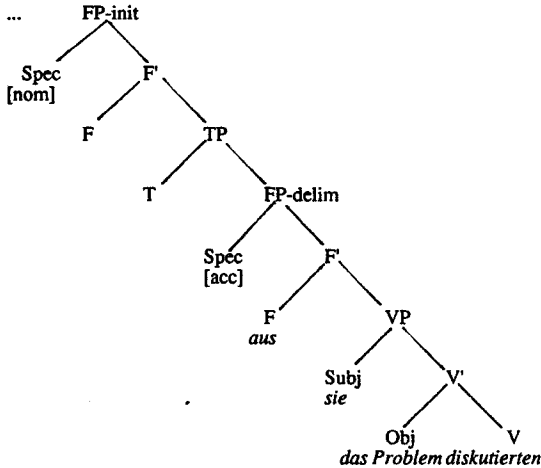
This theory captures the basic German facts observed above, but also has many problems. I will first show where the theory works well for German.

3.2. German as a D-language

Since event structure in German is sensitive to properties of the internal argument, and since particles delimit, but do not initiate events, German can be assumed to be a D-language, in which FP-delimitation is basic.

The delimitation effect of particles can then be explained as follows: Delimiting particles have a feature [+delim], and head FP-delimitation. As an example, consider the following structure for a particle verb denoting an accomplishment.

(23) Structure of *Sie diskutierten das Problem aus*, cf. (10c)



The FP-delim gives the sentence its accomplishment reading. The internal argument *das Problem* 'the problem' moves to the Spec of this phrase, where it receives the "delimiter" event role (Ritter & Rosen 1998), as well as accusative case.

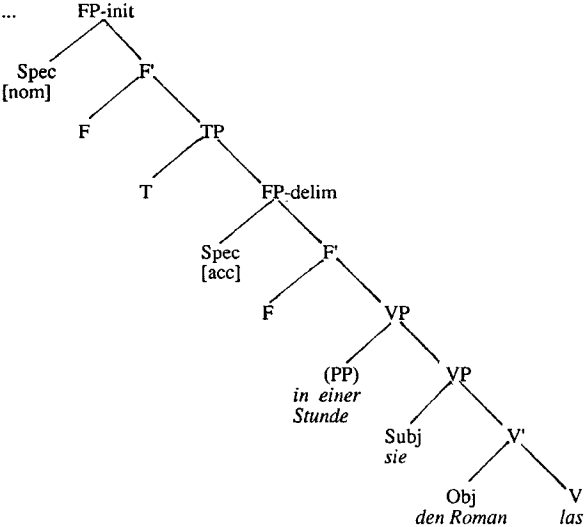
FP-delim licenses an FP-init. The external argument *sie* 'they' moves to Spec, FP-init, where it receives the "initiator" event role and nominative case. In a matrix clause, the verb *diskutierten* 'discussed' moves through TP to the head of CP, which results in the typical V2 word order. In an embedded clause, the verb remains *in situ*, and only its tense and agreement features move to T for checking.

This syntactic approach nicely captures the semantic effect of the particle (delimitation), while still allowing the particle to be separable from the verb. It also explains the fact that most, perhaps all, accomplishment verbs are transitive: Since in D-languages, FP-delim is basic, there can be no endpoint interpretation without a delimiter (an argument in Spec, FP-delim). In other words, a direct object is required in order to express delimitation.

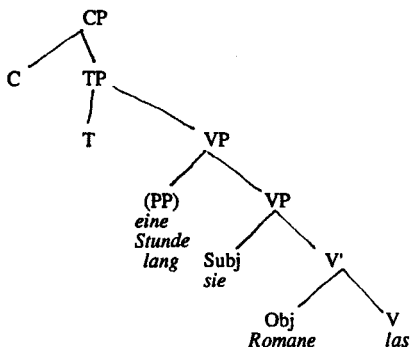
This, in turn, explains the transitivizing effect of particles on intransitive base verbs: The particle verb requires a delimiter (direct object). Likewise, the theory explains why particle verb formation is highly productive with activity verbs: These verbs do not have an FP-delim, so there is room in the syntactic structure for such a phrase. The particle is the means to add FP-delim.

Another fact which this theory captures well is the distinction between specific internal arguments, which delimit, and nonspecific ones, which do not delimit. These two types of constituents also differ in their position in the sentence: Nonspecific NPs occur closer to the VP, following time adverbials, while specific DPs usually occur further away from the VP and before time adverbials. These facts can be explained by assuming that the former move to Spec, FP-delim, while the latter do not:

(24) a. Structure of *Sie las den Roman in einer Stunde*, cf. (5b)



(24) b. Structure of *Sie las eine Stunde lang Romane*, cf. (5c)



Perhaps this difference between specific and non-specific objects has to do with their internal structure: Specific objects have an overt determiner (are DPs), whereas nonspecific objects do not. This difference could be captured by saying that nonspecific objects are not DPs, but NPs or even bare Ns. Then it could be assumed that DPs (not NPs/Ns) have a feature [+delimit], which can be checked in Spec, FP-delim. This causes DP objects to move and realize the delimitation meaning, while NP/N objects stay *in situ*, and no delimitation occurs.

To sum up: The present theory captures the delimiting function of particles and specific objects. It also explains the word order difference between specific and nonspecific objects.

Beyond these basic facts, Ritter & Rosen's approach runs into many problems in German. I will point out the most important ones in the next section.

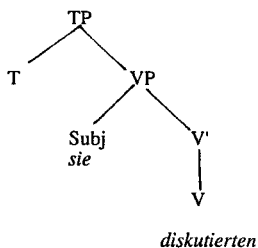
3.3. Problems

First of all, specific objects do not always cause a delimitation reading. We said above that sentences with specific objects plus an activity verb can be interpreted as accomplishments or as activities. So, one can felicitously say in German *Sie las den Roman eine Stunde lang* 'she was reading the novel for an hour', cf. (5b) above. Judging from the word order, this DP is in the same position, presumably Spec, FP-delim, as shown in (24a). We cannot explain why, even though the position is the same, no delimitation reading occurs. Moreover, it was found in section 2 that the context (discourse) is needed to disambiguate the event structure of sentences with an activity verb plus a specific object. As with most syntactic theories, the present approach is not able to capture the role of discourse effects.

Second, the fact that nondelimiting particles display the same morphosyntactic behavior as delimiting ones is difficult for Ritter & Rosen's approach. Only delimiting particles can head FP-delim, whether they are base-generated there, or move there from some other position. Therefore, some word order differences between delimiting and non-delimiting particles would be expected, but such differences do not exist. The other possibility, namely to allow nondelimiting particles into FP-delim, is unattractive because it defeats the very point of this approach: That there is a structural difference between delimitation and non-delimitation.

The third problem lies in case assignment: How do arguments in sentences without FP-delim/FP-init get accusative/nominative case? For example, consider the base verb of (11a) above, which refers to a nondelimited activity:

(25) Structure of *Sie diskutierten*, cf. (11a)



Since there is no FP-delim, there cannot be an FP-init either. However, by assumption, structural nominative case is assigned in FP-init only. This wrongly predicts that *sie* 'she' is not nominative. One solution is to assume that the subject receives nominative case in TP, which is event-neutral. This assumption must be extended to subjects of all nondelimited events. It is not very attractive, since we basically have to claim the existence of two separate nominative cases, one assigned by FP-delim, and one by TP. This amounts to saying that there are two different kinds of subjects; however, there is absolutely no independent evidence for such a claim.

A similar problem is created by the fact that objects of activity verbs are assigned structural accusative case. For example:

- (26) a. *Sie bewunderten das/*dem Gemälde* (eine Stunde lang/*in einer Stunde).
 'They admired **the-ACC/*the-DAT** painting (for an hour/*in an hour).'
 b. *Das Gemälde wurde von ihnen* (eine Stunde lang/*in einer Stunde) bewundert.
the-NOM painting was being admired by them (for an hour/*in an hour).

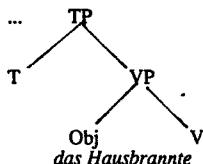
(26a) shows that *das Gemälde* is indeed assigned accusative case, and (26b) shows that it can undergo passivization, an operation which is restricted to structural objects. Since these sentences do not contain an FP-delim, no accusative case should be assigned. Ritter & Rosen (to appear) propose that these objects receive partitive rather than accusative case⁷. However, this analysis cannot be extended to German. There is simply no difference in case assignment between delimited and nondelimited objects. Even nonspecific objects, which have been shown never to delimit, can be passivized, and thus behave like objects with structural accusative case:

- (27) a. (Eine Stunde lang/*in einer Stunde) wurden (von ihr) **Romane** ausgelesen.
 (For an hour/*in an hour) novels were 'read out' (by her).

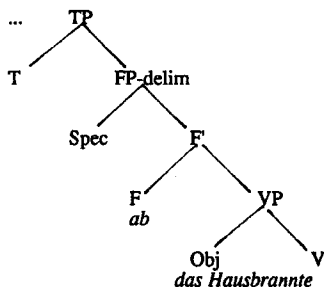
The uniformity of accusative and nominative case assignment in German, irrespective of event structure, is thus a serious problem for the present approach.

The final problem I would like to mention has to do with the role of FP-init. So far, I have only considered instances where agentive activities turn into accomplishments. However, particles also serve to delimit nonagentive activities, turning them into achievements. We assume the following structures:

(28) a. Structure of *Das Haus brannte*, cf. (16a)



b. Structure of *Das Haus brannte ab*, cf. (16b)



Brennen 'burn' has as its single argument a theme, so I assume it is an unaccusative verb. In (28a), the verb's internal argument *das Haus* raises to TP (and then CP), presumably to get case and to check the strong D-feature of T (i.e., to satisfy the EPP). Since there is no FP-delim, there is no FP-init either. In (28b), the delimiting particle *ab* requires the presence of FP-delim, which it heads. Therefore, the event now has an endpoint: It is an achievement.

What is unclear (besides the question why *das Haus* does not receive accusative case in Spec, FP-delim) is why no FP-init is present. So far, we have assumed that FP-delim licenses FP-init. But this cannot be the case in achievement structures. The question, then, is which element or which mechanism determines the appearance of FP-init. There must be some factor other than FP-delim, or all delimited events would have to be accomplishments.⁸ The deeper issue here seems to be that German is not only sensitive to delimitation and object properties, but also to agency: It divides activity verbs into an agentive and a nonagentive class for particle verb formation. Thus, German shows a property of an I-language in addition to some D-language properties. It does not fall neatly into one or the other category, and the theoretical apparatus is inadequate for capturing this.

To summarize, the approach which proposes projections whose main function is event delimitation/initiation, is problematic because it cannot account for (i) the uniform morphosyntactic behavior of delimiting and nondelimiting particles in German, and (ii) subtle interactions of specific objects with activity verbs, where the discourse is involved in disambiguating event structure. A third major problem of this approach is the correlation of FP-delim/FP-init with case assignment, since case assignment in German seems to be insensitive to event structure/specificity of an argument. Finally, since German is sensitive to agency, it shows I-language as well as D-language properties.

The first problem, the existence of delimiting as well as nondelimiting particles in German, suggests that particles cannot be base-generated in FP-delim. The problem with case assignment suggests that Agr-oP and Agr-sP should be used instead of FP-delim/FP-init, in order to achieve uniform case assignment of all subjects and direct objects, respectively. And German's sensitivity to agency should be structurally encoded.

The next section is a first attempt at developing a theory which takes up these suggestions.

4.0. VP shells

In the literature, there exists another approach which may be able to account for event structure effects: VP shell analyses. Interestingly, they have been used to distinguish agentive (unergative) from nonagentive (unaccusative) verbs (e.g., Hale & Keyser 1991, 1994, Pesetsky 1995, Chomsky 1995). Agents occur in the higher VP, and themes are the "subjects" of the lower VP. Such a structure would be able to capture German's sensitivity to agency. Complements (PP/AP) can occur in the lower VP, and they usually serve to delimit an event. Thus, event delimitation could also be accounted for. It seems, then, that a VP shell analysis may be used to explain event structure. I will follow the theory developed by Hale & Keyser in recent years (e.g., Hale & Keyser 1991, 1994).

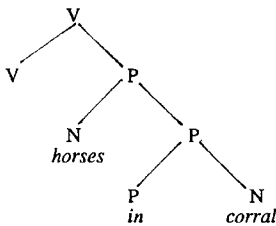
4.1. Hale & Keyser's theory

Hale and Keyser observe that there is a highly limited number of possible argument structures of verbs, and they try to account for this constrained nature of argument structure. They assume that constraints on argument structure derive from the simplicity of the lexical elements involved in syntactic projections, and from the highly limited number of possible syntactic combinations. The lexical elements involved in argument structure are V, N, P, A, and they are assumed to have the following properties:

- (29) a. verbs: require a complement, but do not have a subject
- b. nouns: have neither a subject nor a complement
- c. adjectives: have a subject, but no complement
- d. prepositions: require a complement and a subject

Since Hale & Keyser assume that these constraints are at work in the *lexical* formation of verbs, there are no modifiers. Also, verbs only take subjects post-lexically in the "sentential syntax", where verbs' predicating capacity may be activated by "an appropriate syntactic environment" such as TP, which provides temporal reference (Hale & Keyser 1994). However, it is syntactic principles which further limit the possible combinations of these elements: The Projection Principle limits projections to binary branching ones, and the Empty Category Principle/Head Movement Constraint limits movement of the elements. Following is an example of how this theory works:

(30) She corralled her horses.



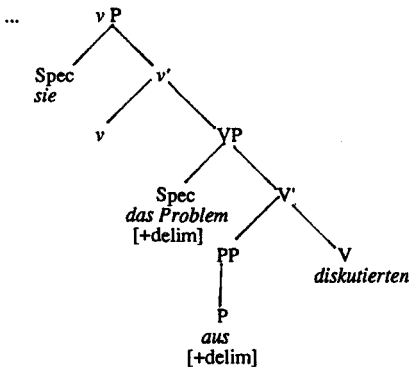
The verb *corral* is derived through incorporation of the noun *corral* into the preposition *in*, then this complex incorporates into the phonetically empty V, which may mean something like 'get/become'. If there is a higher V, it has causative/agentive meaning ('cause').

Following Chomsky (1995), I will adapt this VP shell analysis, and will assume that the argument structure is derived in the *syntax*, rather than the lexicon. Since in "sentential syntax" T is present, verbs can have subjects. The higher V is called *v*. I will also assume that PPs do not require a subject in sentential syntax. Let us now see how this theory works.

4.2. Particles

This VP shell analysis can derive both kinds of particle verbs, those with delimiting and those with nondelimiting particles. All particles are base-generated as complements of the lower V. We will consider verbs with delimiting particles first:

(31) Structure of *Sie diskutierten das Problem aus*, cf. (11c)



The initial bound of the event is provided by *v* P, which is projected because of the presence of the specifier *sie*. The final bound is created as follows: The particle *aus* heads a PP, which may have no complement at all as in (31), or may have a phonetically null complement.⁹ It has an interpretable feature [+delim]. The particle's feature by itself is not sufficient to provide the final bound of the event. In order for the delimitation reading to obtain unambiguously, there must be a specific DP in Spec, VP. One could propose that specific arguments, i.e., DPs, also have a feature [+delim], which may be uninterpretable. The particle's feature moves to V and, from there, checks the DP's feature. Only in this case (and if there is a Spec in *v*), does the accomplishment reading occur unambiguously. (The verb and the arguments move to higher positions (Agr-oP, Agr-sP, *v* P, TP, CP) in finite matrix clauses.)

If only one [+delim] feature is present (only the particle or only a specific internal argument), delimitation is possible, but not obligatory, and the context is needed to clarify the interpretation. However, it is still unclear how to account for this role of the discourse. Another open question is what happens if a [+delim] feature can't be checked. Why does the derivation not crash in this case?

However, this theory does capture the subtle interactions between the different elements involved in event delimitation. It also allows us to say that some particles always have a delimiting effect, even though this effect may be obscured by other factors.

Nondelimiting particles are simply accounted for by saying that they do not have an inherent feature [+delim]. Thus, no such feature can check a DP's [+delim] feature, and no delimitation reading occurs. The sentence refers to an activity.

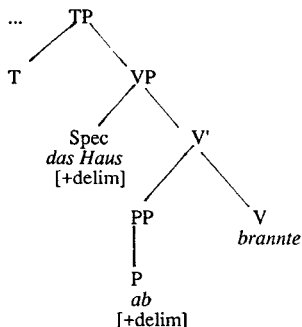
Since the only difference between delimiting and nondelimiting particles lies in the presence or absence of a feature, both types of particles are predicted to behave identically in terms of word order and morphosyntax. This is the desired outcome.

It should be noted that using a feature to distinguish between the two types of particles amounts to locating the difference between them in the lexicon. This makes sense, however, because the presence or absence of the delimiting function seems to be related to the particle's meaning. The delimiting particles mean something which implies an endpoint, e.g., *ab* 'off', while the meaning of nondelimiting particles does not imply an endpoint, e.g., *mit* 'with'.

So, the theory combines lexical information (features) and syntactic mechanisms (checking, movement). It is not a purely syntactic analysis of event structure, but this way it may actually come closer to the German facts.

Before discussing internal arguments in more detail, I would like to comment on achievements. Recall that delimiting particles can also serve to derive achievements from nonagentive activities, and that the agency-based distinction between achievements and accomplishments was not very clear in Ritter & Rosen's theory. In the VP shell analysis, v P distinguishes between these two aspectual classes. v P is present in the structure of accomplishments, but not in achievements. For example:

(32) Structure of *Das Haus brannte ab*, cf. (16b)



Since *brennen* has a theme argument, the subject *das Haus* originates as the internal argument (Spec, VP). It cannot originate in Spec, v P because this would imply some causation/agency, which is absent. Since no v P is required for this sentence, by economy and Full Interpretation, it is not projected either. Thus, the absence of v P correlates with nonagency (here, of activities).

Das Haus is specific and thus has a feature [+delim] which is checked by the particle's [+delim] feature (which raised to V). Thus, the event has a final bound, but no initial/agentive bound, and the outcome is an achievement, as desired. (Again, *das Haus* and the verb raise to CP in finite matrix clauses.)

In sum, the VP shell analysis relies heavily on lexical information (features), but is quite successful in accounting for the role of particles in event structure. It also provides a simple distinction between delimiting and non-delimiting particles, and between agentive accomplishments and nonagentive achievements.

A remaining open question is how states would be expressed in this theory. Would they pattern with nonagentive activities? VP shell theories are not directly sensitive to event structure, but their constructs can be used to express some aspects of event structure (e.g., delimitation). This raises the question of whether event structure is a grammatical primitive, as assumed by

Ritter & Rosen, or whether it is derived from the primitives used in VP shell theories. If event structure/aspectual classes are not grammatical primitives, perhaps "state" is not an independent category, and so accounting for states is not an issue.

I will now consider the analysis of internal arguments in more detail.

4.3. Internal arguments

There are three facts about internal arguments that need to be accounted for: (i) all internal arguments receive structural accusative case, (ii) nonspecific objects prevent delimitation, and (iii) nonspecific objects occur in a lower position in the sentence than specific ones.

The explanation of (i) is straightforward. All internal arguments receive accusative case in Agr-oP. Accusative case is not tied to event delimitation (neither is nominative case tied to event initiation), which is a clear advantage of this theory regarding German.

Second, nonspecific objects (NPs/Ns rather than DPs) are assumed not to have a feature [+delim]. Therefore, no feature checking can take place with a delimiting particle's feature, and no delimitation interpretation can occur. The presence of the particle's feature by itself may have something to do with the iterative sense of such sentences (an unspecified number of accomplishments/achievements, cf. (9)), but I have no clear idea how this might work.

Finally, the word order facts (see section 3.2., particularly (24)) cannot be directly derived from delimitation in the VP shell analysis, since there are no special positions for delimiting arguments. I propose that the word order differences have to do with the nature of specificity. Enç (1991:21) says that the hallmark of specificity is "linking NP denotations to previous discourse".¹⁰ This means that only specific objects are topics, while nonspecific objects are not unless they are generic, which requires a certain context. It is probably this topicality which allows DPs to move higher up in the tree than nontopical NPs, which seem to be inert. The higher position may be some discourse-related functional projection (perhaps TopP or FocP). Some evidence for this comes from subtle meaning differences such as the following:

- (33) a. Sie las den Roman in einer Stunde aus.
She finished reading the novel in an hour.
b. Sie las in einer Stunde den Roman aus.
In one hour she finished reading the novel.

(33a) represents the canonical word order and meaning. The order in (33b) suggests special emphasis on *in einer Stunde*. The time adverbial seems to occupy a discourse-related preverbal FP, while the DP has stayed down (perhaps in Spec, Agr-oP), forming an informational unit with the verb.¹¹ In (33a), it is the direct object *den Roman* which receives focus and moves up, probably by default.

To sum up, all three characteristics of internal arguments can be explained in the VP shell analysis. Most importantly, case marking of all subjects and objects is uniform and insensitive to event structure.

Furthermore, the VP shell analysis accounts for German's sensitivity to agency. It also provides a uniform account of the morphosyntactic class of particles, while still capturing the differences between delimiting and non-delimiting particles, and the interaction between verb, particle and internal argument in event structure.

5.0. Conclusion

In this paper, I have attempted a syntactic approach to event structure in German. A careful analysis of German data revealed the following facts, which need to be captured by the approach:

- (34) a. activity verbs serve as base verbs for particle verb formation, with a distinction in terms of agency
b. some particles have a delimiting function, and are a major means of creating accomplishment or achievement verbs (from agentive versus nonagentive activity base verbs)
c. some particles do not have a delimiting function

- d. accomplishment verbs are usually transitive
- e. specific internal arguments (DPs) serve to delimit an event, while nonspecific internal arguments (NPs/Ns) prevent delimitation
- f. the aspectual roles of the base verb, the particle and the internal argument interact with each other.

The first step was to apply Ritter & Rosen's theory, which attempts to formalize event structure explicitly through the functional projections FP-delim and FP-init. This theory provided the insight that German is a language in which delimitation seems to be grammaticalized in delimiting particles and in properties of the internal argument. However, the existence of nondelimiting particles, as well as the uniform case-marking of all subjects/objects, irrespective of event structure, presented major problems. The theory also could not account for distinctions in terms of agency in German.

In order to overcome these problems, I attempted a VP shell analysis, following Hale & Keyser's proposals. In the VP shell analysis, the higher verb, *v*, represents agency. If it is not present, there is no agency. Event initiation is not directly represented, and indeed this is unnecessary in German. Event delimitation is encoded in the lower VP. I have assumed that particles head a PP, which is the complement of V. Only a lexical feature [delim] was used to distinguish delimitation. This is not a purely structural analysis of event structure, since there is no structural difference between delimited and nondelimited events. However, this kind of analysis is required by the German data, where all particles occur in the same positions, and all arguments are case-marked in the same way.

In light of these considerations, it becomes questionable whether German really is a D-language, and how valid the distinction into I-languages and D-languages is. In fact, the VP shell analysis suggests that event structure and aspectual classes are not grammatical primitives, but can be derived from notions such as agency and from characteristics of lexical categories (e.g., delimiting prepositions).

I conclude that event structure is not a primitive of grammar. In German, it is determined partially in the syntax (*v* Ps for agency), and partially by lexical information (features). Discourse probably also plays a role, as Enç's discourse-based distinction between specific and nonspecific arguments has been so pervasive in this analysis of German. Further research may reveal that specificity, and thus discourse factors, are grammaticalized in arguments in German (DP versus NP/N, word order). This would not be surprising, given that word order in German is relatively free. As Krifka (1998:108) states, such a language is "free to exploit word order differences to express properties like the discourse-pragmatic status of constituents (givenness, focus, etc.)". It is therefore crucial that the role which internal arguments and specificity/discourse play in event structure and in general be explored more fully.

While this paper has not provided a definitive answer to the question of whether event structure is syntactically encoded in German, it has presented a number of facts (cf. (34) above) which any theory of event structure, and indeed any theory of German, needs to take into account.

6.0. Notes

* This paper grew out of a graduate syntax course taught by Dr. Elizabeth Ritter and Dr. Norri Erteschik-Shir at the University of Calgary, and it would not have been possible without their suggestions and feedback. I am also grateful to Joachim Kunzmann, Volker Kunzmann, and Markus Wilhelm for patiently checking my examples. All remaining errors are of course my own.

The only abbreviation used which may be unfamiliar is 'PT' for 'particle'. Also note that in most examples, an asterisk does not strictly indicate ungrammaticality, but rather semantic or pragmatic abnormality.

- 1 Another way to delimit events is by using perfective aspect. A discussion of aspectual morphology is beyond the scope of this paper.

- 2 My use of the term 'specific' is based on Enç (1991), where definite "NPs" are specific, and bare NPs aren't. DPs with an indefinite article can be either specific or non-specific, depending on discourse. For the purposes of this paper, I will ignore the latter distinction and call all DPs with an overt article "specific", including all DPs with an overt indefinite article.
- 3 Stiebels & Wunderlich (1994) might classify this and a few other examples as resultatives. Following Neeleman & Weerman (1993), they distinguish between particle verbs and resultatives: "True" particles are considered a zero-level lexical category, while resultative elements (often homophonous to particles) are considered maximal projections. Since they are maximal projections, they can contain other elements, and they can move, e.g.:

- (i) Sie hat den Roman [ganz aus-]gelesen.
'She finished the novel completely.'
- (ii) [Ganz aus] hat sie den Roman nicht *t* gelesen.
'Completely finish the novel, she didn't.'

However, these tests are not very convincing, since in (i) *ganz* 'completely' could also be analyzed as referring to the particle verb as a whole, and since other movement tests work less well or suggest heads can move, too:

- (iii) ?Aus hat sie den Roman nicht *t* gelesen.
'Finish the novel, she didn't.'
- (iv) ?Aus hat sie den Roman nicht [ganz *t*] gelesen.
'Finish the novel, she didn't completely.'

Thus, it is far from clear that (*ganz*) *aus* really is a maximal projection.

While I could easily accommodate maximal projections (cf. section 4), I will not make the questionable distinction between particle verbs and resultatives, but will treat all particles as "true" particles.

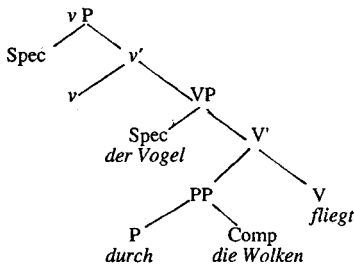
- 4 As such they can only survive if they are foci, and the pragmatic context to provide a good existential/focus reading is also missing.
- 5 With some verbs, the delimiting effect of the particle is less clear: Without a particle they are activity verbs, but with a particle they are either activities or accomplishments, e.g., *reiten* 'ride' and *zureiten* 'break (a horse)', *arbeiten* 'work' and *durcharbeiten* 'work through', *graben* 'dig' and *umgraben* 'dig over/around'. I believe that the particles still have a delimiting function in these verbs, since without them the verbs can only refer to activities. However, there are other factors (verb meaning, internal argument) which easily override the particles' delimiting effect.

I think an analysis in terms of the features [delim(itation)] and [init(itation)] could account for these subtle differences. For example, *reiten* may be [+init, -delim]. If combined with *zu*, which is [+delim], the [delim] features cancel each other out, and the particle verb *zureiten* only has the feature [+init], which can refer to either an activity or an accomplishment. However, conducting a full feature analysis is beyond the scope of this paper.

- 6 While I have the intuition that *an* in the sense of 'partially completed activity' may involve the notion of accomplishment as well as activity, I have not been able to confirm this intuition with other native speakers. In their judgements, *anlesen* and similar verbs fail all accomplishment tests. Therefore, I will assume for now that verbs with *an* are activity verbs.
- 7 Another suggestion would be that the verbs assign inherent accusative case to these objects, but the problems are the same as with the partitive case analysis.
- 8 More generally, there is also the question of how FP-init "knows" whether FP-delim, its licensor, is present.

9 In prefix verbs, the P has an overt complement:

(i) (daß) *der Vogel die Wolken durchfliegt* ' (that) the bird flies through the clouds'



P has to incorporate into its governing head, V, since it is inseparable from the verb. This gives us the desired word order as well.

The distinction between particle verbs and prefix verbs in terms of the internal structure of PP is supported by the fact that prefix verbs like *die Wolken durchfliegen* have a PP V counterpart *durch die Wolken fliegen*, while particle verbs (e.g., *das Problem ausdiskutieren*) have no such counterpart (**aus das/dem Problem diskutieren*). Prefix verbs thus involve true preposition incorporation, while particle verbs do not.

10 This correlates with the presence of a (definite) determiner.

11 Based on intonation and scope facts, Krifka (1998) argues for the existence of an "integrated preverbal predicate" and focus assignment to the constituent immediately preceding it. In (33b), [*den Roman auslas*] probably forms such a unit (later, the verb *las* moves), and the preceding phrase *in einer Stunde* receives focus.

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**What's all the fuss about 16 words?
A new approach to Holtzmann's Law***

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Abstract

This paper provides a unified analysis for Holtzmann's Law or the Germanic *Verschärfung* (hereafter, GV). This Germanic phenomenon is usually described as the strengthening of the PIE glides *i and *u to Gothic <ddj> and <ggw> and Old Norse <ggj> and <ggw> respectively. In the present work, I posit plausible sound changes based on the assumption that laryngeals were extant in early Germanic when the accent was still mobile. Furthermore, I contend that the laryngeals rather than glides underwent GV strengthening. The motivation for sound changes, as I assert, can be explained by the preference laws of syllable structure. The analysis provided herein also accounts for parallel phonological developments of GV and non-GV forms from common PIE roots, e.g. ON *snūa* 'to turn' versus ON *snugga* 'to look askance'. Finally, the analysis offers an explanation for the existence of GV reflexes in West Germanic.

0.0 Introduction

Holtzmann's Law has attracted considerable attention from Germanists since its initial "discovery" over a century ago. Also known as the Germanic *Verschärfung* (hereafter GV), this phenomenon has traditionally been described as the purported development of the PIE glides i and u in the three branches of Germanic. The reflexes of these changes are depicted orthographically by Gothic <ddj> and <ggw> and North Germanic <ggj> and <ggw> respectively. By contrast, the corresponding West Germanic reflexes contain a diphthong plus heterosyllabic glide. The apparent similarity between the Gothic and North Germanic forms has caused many Germanists to postulate a common East-North Germanic development separate from West Germanic. Thus, the potential implication for the genealogy of Germanic explains why this relatively small data set, consisting of approximately sixteen words according to some linguists (cf. Marchand 1973, Collinge 1985:93), has attracted such attention.

Although GV has been analysed from numerous perspectives within a

*This paper provides a summary of the analysis presented in my MA Thesis, "Holtzmann's Law: Getting to the *hart* of the Germanic *Verschärfung*" submitted at the University of Calgary. The title for this paper is based on a question posed by Dr. Archibald. I am extremely grateful to my advisor, Dr. Robert W. Murray, for his assistance and guidance throughout my research. My thanks also go to Dr. Doug Walker and Dr. John Archibald for feedback on the thesis itself, and to David Restle, Iva Gojmerac and Stephen Laker for input on this version. I would like to especially thank Bruce Nyssetvold for his assistance in the transmission of this paper. Nevertheless, all errors are still my own.

multitude of frameworks, no single theory thus far has provided an adequate explanation or motivation for the phenomenon. This paper will provide a brief overview of the analysis presented in L.C. Smith (1997b). Rather than rejecting all past work, this analysis combines a number of features and strengths from past approaches, including variable accent placement, laryngeals and Verner's Law. I will argue that the Preference Laws for Syllable Structure (Murray and Vennemann 1983, Murray 1988, and Vennemann 1988) can account for how these factors, when combined, created the environment for the phenomenon to develop. This approach will attempt to account for the parallel GV and non-GV developments, e.g., ON *snugga* 'to look askance' vs. ON *snūa* 'to turn, twist', as well as the occurrence of sporadic GV forms in West Germanic where GV has traditionally been considered not to have occurred. In order to facilitate discussion of the phenomenon, I now turn to a description of the data cited as evidence for GV.

1.0 Evidence for the Germanic *Verschärfung*

1.1 Evidence from Gothic and Old Norse

Traditionally the GV data have been interpreted as the development of the PIE glides, *i̯* and *u̯*, following a short vowel. These changes resulted in the so-called "geminate" obstruents in Gothic and Old Norse.¹ By contrast, the West Germanic forms contain diphthongs. Data illustrating these developments are provided below in (1).²

(1a)	PIE <i>i̯</i> > Go. <ddj>/ON <ggj>		
	Gothic	North Germanic	West Germanic
	<i>twaddje</i>	ON <i>tveggja</i>	OHG <i>zweiſjo</i>
	'two (gen.)'		
	<i>waddjus</i>	Oícel. <i>veggjar</i>	OS <i>wei</i>
	'wall'	(gen. sg.)	

¹In L.C. Smith (1997b: Chapter 2), I provide arguments for my interpretation of the ON and Gothic GV segments based on phonological and orthographic evidence. My interim conclusions are as follows:

Go.	<ddj> = [d̥j] (or [dd̥j])	ON	<ggj> = [g̥g̥j]
	<ggw> = [g̥w] (or [gg̥w])		<ggw> = [gg̥w]

²Based on the data in (1), GV has traditionally been described in terms of a two stage development, namely the lengthening or gemination of the PIE glides (supposedly evidenced by the West Germanic forms) and stage two as the strengthening of these glides in Gothic and Old Norse.

(1b)	PIE μ > Go. <ggw>/ON <ggw>		
	Gothic	North Germanic	West Germanic
	<i>triggws</i>	OÍcel. <i>tryggver</i>	OHG <i>gitriuwi</i> , OE <i>trēowe</i>
	‘true’	(nom. pl. masc.)	
	<i>skuggwa</i>	ON <i>skuggi</i>	OHG <i>scuwo</i>
	‘mirror’	‘shadow’	
	<i>glaggwuba</i>	ON <i>glōggr</i>	OHG <i>glouwer</i> OE <i>glēaw</i>
	‘carefully’	‘sharp-minded; clear’	

The Gothic reflexes seen in (1a) and (1b) provide clear evidence for GV. However, the GV effects in some Old Norse forms have been obscured by further sound changes which operated before the literary tradition commenced its recording of the language. For example, ON *skuggi* ‘shadow’ arose following the application of the Old Norse μ -deletion rule (i.e., μ > \emptyset) (Voyles 1992). Nevertheless, since all such deviations from the expected GV output, i.e., *ggj* and *ggw*, can be explained by phonological developments at work elsewhere in the language, then the Old Norse data can still be judged to provide strong evidence for GV.

1.2 Evidence from West Germanic?

From the data in (1) it appears that GV strengthening occurred exclusively in Gothic and Old Norse. However, a closer examination of the incidence of GV throughout Germanic reveals the existence of GV reflexes even in West Germanic. Examples of such reflexes are cited below in (2).

(2)	Gothic	Old Norse	West Germanic
	<i>triggws</i>	<i>tryggua</i>	OE (var.) <i>trugian</i> , <i>trygian</i> ‘to believe’ ³
	-----	<i>bryggia</i> ‘pier’ (cf. <i>brú</i> ‘bridge’)	OS <i>bruggia</i> , OHG <i>brukka</i> , OE <i>brycg</i> , OFris. <i>bregga</i> ⁴ ‘bridge’
	-----	<i>mygg(a)</i> (OSwe.)	OS <i>muggia</i> , OHG <i>mucca</i> , MHG <i>mucke</i> , OE <i>mycg(e)</i> , North Fris. <i>mech</i> ⁵ ‘mosquito, midge’

The occurrence of such West Germanic GV forms may be best explained if we assume GV to have operated during Proto-Germanic. Two pieces of evidence

³These variant forms of the verb *trūwian* ‘to believe’ come from Holthausen (1934: 354) who also cites the stem *trug-* as a variation of *truw-*.

⁴Two points should be noted for these examples. First, in Old High German, *gg* often developed to *kk* (also *ck*, *cc*) (Wright 1907, Ellis 1966). This was the result of the High German Sound Shift. Secondly, the OS and OHG examples are from Lehmann (1952) who reconstructs the root as PIE *+bhreXwa-*. The OE and OFris. data come from Holthausen (1934).

⁵The OS, OHG, MHG and OE data are from Lehmann (1952). The NFr. form comes from Holthausen (1934).

can be cited in favour of this claim. First, if West Germanic's GV-like cognates existed in only one or two dialects, then a case could be made that these forms had been borrowed from Old Norse and Gothic. However, the occurrence of these forms in at least four separate and geographically distinct West Germanic dialects is not so easily explained by borrowing. Moreover, that the dialects would opt to borrow the same lexical items would be more than highly coincidental.⁶ Secondly, with the exception of the Old English verb forms for 'believe', the West Germanic data in (2) appear to have undergone West Germanic gemination (WGmc. *C.CG < *C.G)⁷ which would point to a common West Germanic etymon for each item prior to gemination.⁸ If this were the case, then these etyma would have already contained the sequence *plosive + glide* in West Germanic thereby accounting for the geminate plosives in the dialects. Moreover, if both West Germanic and North Germanic cognates possessed GV obstruents, then we would be inclined to reconstruct the Proto-Germanic etymon from which these items developed as also containing the GV obstruents. This would then point to the operation of GV in Proto-Germanic.

The West Germanic examples, therefore, may provide evidence that GV occurred in Proto-Germanic prior to the break up of the three Germanic branches. Thus, like Davis and Iverson (1996), I will assume that GV was a common Germanic development rather than one that simply obtained between Old Norse and Gothic. This assumption will facilitate an explanation of the existence of West Germanic GV forms.⁹

With these assumptions in mind, I now turn to the foundation of my analysis.

2.0 From PIE to Germanic

Based on the assumption that GV occurred at some point following the departure of Germanic from IE and before it split into the three branches, namely Gothic, North Germanic and West Germanic, it becomes necessary to examine some of the features which Germanic would (or may) have inherited from PIE. In this

⁶Arguments can be made against borrowing based on the West Germanic cognates for *bridge*. The Old Norse *bryggja* 'pier' contrasts with the non-GV *brú* 'bridge' (Lehmann 1952: 47). However, all West Germanic GV forms in (2) above mean 'bridge' NOT 'pier'. If this GV form in West Germanic resulted from borrowing, why did the West Germanic dialects not borrow *brú* for 'bridge'? It would appear unlikely that four dialects would all borrow the same word AND would then associate the same new meaning with this borrowed word (where the new meaning was different from the original sense) instead of borrowing the word with the desired meaning in the first place (e.g., ON *brú* 'bridge') (cf. L.C.Smith 1997b).

⁷This is the triggering sequence for West Germanic gemination reconstructed by Murray and Vennemann (1983), Murray (1988) and Vennemann (1988).

⁸Sievers (1903: 155) states that <cg> in Old English, e.g., *brycg*, *mycg(e)*, originally represented a geminate plosive. Subsequently, these plosives underwent palatalisation and affrication before a palatal vowel (cf. the <e> in OE *mycg(e)*) resulting in the alveo-palatal affricate [tʃ], e.g., *judge*.

⁹The small number of GV forms in West Germanic may be the result of levelling which eliminated the effects of GV in this branch of Germanic.

section, I first explore the possibility that laryngeals were maintained in Germanic before turning to a discussion of mobile accent in IE and Germanic.

2.1 *Laryngeals in Germanic?*

The phonological system of PIE included a number of consonants which were ultimately lost in later stages of most IE dialects leaving behind no direct reflexes. Nevertheless, these so called laryngeals played an important role particularly in the phonology of the IE vowels. Most notably, laryngeals have been implicated as the cause of ablaut or vowel gradation as found in *sing, sang, sung*.¹⁰ Thus, the effects of laryngeals are ubiquitous throughout the Germanic languages. However, this begs the question as to how long, if at all, laryngeals persisted in Germanic before ultimately being “lost”.

Various arguments have been forwarded regarding the maintenance of laryngeals in Germanic. Polomé (1988:384) states that if we adhere to Kortland’s (as cited in Polomé 1988) argument that the final loss of laryngeals in Slavic likely occurred by the end of the 8th century AD, then we could suppose that laryngeals persisted “in Proto-Germanic until at least the middle of the first millenium B.C.” If we assume with Polomé (1982) and Vennemann (1985a) that Germanic was indeed very conservative, then it would be plausible that laryngeals survived this late in Germanic. Although we are unable to determine the precise time when laryngeals were ultimately lost in Germanic, the likelihood still exists that laryngeals were maintained during at least an early period of Germanic. Furthermore, it has been noted that laryngeals “were maintained relatively late when in the neighbourhood of resonants” in the IE dialects (Lehmann 1993:110, cf. also Lehmann 1952) and in particular that Germanic was exceptionally conservative with regards to the treatment of laryngeals when contiguous to a resonant (cf. Polomé 1988, Lehmann 1952).

Such claims are supported by other linguists who have argued for the maintenance of laryngeals in Germanic (Austin 1946, 1958, Lindeman 1987, Davis and Iverson 1996, Polomé 1949). I will follow suite by assuming that laryngeals were still extant during at least the early stages of Proto-Germanic.

2.1.1 *The phonetic identity of the laryngeal series*

The laryngeal series which I assume is based on Lindeman (1987) and Cowgill (1965) who define their series of laryngeals as dorsal fricatives. Moreover, I espouse Cowgill’s original assumption that laryngeals were voiceless. These laryngeals can be described as follows:

- (3) $H_1 = \text{ç}$ voiceless dorso-palatal fricative (neutral/non-colouring laryngeal)
 $H_2 = \text{x}$ voiceless velar fricative (*a*-colouring laryngeal)
 $H_3 = \text{x}^h$ voiceless labialised velar fricative (*o*-colouring laryngeal)

An examination of the PIE obstruent inventory reveals that this series of voiceless laryngeals fits well into the inventory as illustrated below.

¹⁰For a more complete discussion of laryngeals, the reader is directed to Jonsson (1978), Lindeman (1987) and Lehmann (1952, 1993).

(4)	p	t	k	k	kʰ
	(b)	d	ǵ	g	gʰ
		bh	dh	ǵh	gh
		s			
			ç	x	xʰ

First, the series of dorsal fricatives corresponds to the traditionally reconstructed places of articulation for the PIE obstruent system.¹¹ Secondly, the fricative traditionally reconstructed for the PIE obstruent system is the voiceless dental /s/.¹² A series of laryngeals comprising voiceless dorsal fricatives would therefore appear as a natural extension of a voiceless fricative series in PIE. Thus, the series of laryngeals which I assume is well suited for the PIE obstruent system.

I now turn to a discussion of another crucial factor for my analysis, namely the accent system of PIE and Germanic.

2.2 IE and Germanic accent

2.2.1 Indo-European pitch accent¹³

Throughout the literature, PIE accent has typically been characterised as one of pitch and mobility (cf. Hirt 1931, Prokosch 1938, Bennett 1980, Ramat 1981, Baldi 1983, Szemerényi 1990, and Beekes 1995). This pitch or musical accent was realised by a high tone on a single syllable within a word (Baldi 1983: 16) and could fall on either the root syllable or affix ending of the word. Because of the variable nature of the accent placement, accent could even vary within a paradigm, e.g. Gk. nom. *patḗr* 'father', acc. *patéra*, but gen. *patrós* (Ramat 1981: 17). Evidence for the musical or pitch accent in PIE comes primarily from Vedic, Greek and Balto-Slavic (especially Lithuanian) (Lehmann 1993: 58, Szemerényi 1990, Wright 1917). For example, a comparison of Skt. *pât*, acc. *pâdam*, gen. *padás* 'foot' with the corresponding Gk. *πούς*, *πόδα*, *ποδός* reveals a common accent placement. In the genitive case in both Sanskrit and Greek the accent falls on the suffix. By contrast, the accent in the nominative and accusative forms is placed on the root syllable. At times, Balto-Slavic corroborates reconstructions of PIE accent placement where it agrees with Sanskrit and Greek, e.g., Skt. *nábhas*, Gk. *véφος*, Russ. *nébo* 'heaven, sky' (Szemerényi 1990: 79-80, cf. also Gamkrelidze and Ivanov 1995).

2.2.2 Germanic accent and Verner's Law

By the time the first records of Germanic were written, Germanic, like Romance and Celtic had undergone a change to a fixed stress accent system and therefore provides no direct evidence for PIE accent. However, it has been argued that following its split from IE, Germanic was characterised by a period of accentual

¹¹Various glottalic theories use these places of articulation (cf. Murray 1995:46, Szemerényi 1990:71).

¹²The reconstruction of a single fricative /s/ for PIE is supported by Vennemann (1985a), Szemerényi (1990: 71), Murray (1995: 46), Hopper (1977), etc.

¹³For a more complete discussion of the nature and placement of the PIE accent, the reader is directed to the works cited in this section as well as to D'Alquen (1988) for an overview of the evidence.

mobility similar to the mobile pitch accent of IE (Salmons 1990:141, Bennett 1972). Some scholars have postulated that this period of “free” accent in Germanic lasted anywhere from several centuries to a millennium (Bennett 1972: 100). That Germanic had indeed inherited IE’s mobile accent is best demonstrated by Verner’s Law. According to this law, voiceless fricatives in a voiced environment (e.g., intervocally) became voiced when not immediately preceded by the accent (cf. Lehmann 1992: 154). This law is illustrated by the examples based on Lehmann (1992: 154) below in (5).

(5)	‘brother’	‘father’	Grimm's Law: $t > b$
	Skt. <i>bhrātar-</i>	<i>pitár-</i>	
	Gk. <i>phrātēr-</i>	<i>patēr-</i>	
	Go. <i>brōþar</i>	<i>faðar</i>	
	OE <i>brōþor</i>	ON <i>faðir</i>	

The Germanic cognates for ‘brother’ all contain the voiceless fricative, *b*, as we would expect from Grimm’s Law. However, when the voiced fricatives occurred in place of their expected voiceless counterparts, as in ‘father’, the accent in Sanskrit and Greek was not found to fall on the immediately preceding syllable.

This correspondence between accent and the occurrence of voiced fricatives evidenced by Verner’s Law has also been used to determine the placement of accent on the principle parts of verbs in early Germanic. Typically the effects of Verner’s Law can be seen in the plural preterite¹⁴ but not in the present stem nor singular preterite. Middle High German provides examples to illustrate this alternation (listed as pres./sg.preter.~pl. preter.): *zihen-zīgen* ‘pull’, *slahen-sluogen* ‘slay’, *wesen-waren* ‘be’ and *verliesen-verlurn* ‘lose’ (Pafenberg 1993).¹⁵

Further evidence for the placement of the PIE accent can be cited from vocalic ablaut grades (Gamkrelidze and Ivanov 1995: 166 and Prokosch 1939). It has been argued that full-grade vowels were accented whereas reduced ablaut grade vowels were not. For example, Go. *steigan, staig, stigum, stigans* ‘climb’ reveals a reduced ablaut grade in the last two principle parts of the verb, namely the plural preterite and past participle, indicating that the accent fell on the inflectional suffixes and *not* on the root vowels. Such a claim is substantiated by Verner’s Law above which also provides evidence for suffixal accent in the last two principle parts of verbs. Likewise, the full grade and *a*-grade vowels in the first two principle parts of the verb would point to root accentuation. Again, this is confirmed by Verner’s Law.

With this evidence in mind, I will now provide a brief sketch of the posited

¹⁴The past participle also tends to reveal the effects of Verner’s Law (Prokosch 1939, Voyles 1992). Modern German still provides examples, e.g., *ziehen* (pres.), *zog* (preter.), *gezogen* (p.p.) ‘pull’.

¹⁵The alternation between *s-r* is the reflex of Verner’s Law. The alternation would have originally been *s-z*, but through rhotacism, *z* would have developed into *r*. We see this even today in English *was-were*.

accent placements for PIE. I include only those points relevant for my analysis of GV which follows.

2.3 Accent placement

2.3.1 Verbs

As discussed above, strong verbs were accented on the root syllable in the first two principle parts, namely the present indicative stem and the preterite singular, but on the endings of the last two principle parts, namely the preterite plural and the past participle (cf. also Voyles 1992: 20). By contrast, the endings of the weak verbs and aorist present verbs were accented throughout the paradigms.

2.3.2 Nouns and adjectives

Voyles (1992) differentiates between two major groups of nouns and adjectives with regards to accent placement. “[Masculine] and neuter nouns and adjectives of the *a-*, *wa-*, *ja-*, and the *az/iz-class*” were accented on the stem in the nominative, accusative and vocative, but on the suffix in the genitive and other remaining cases (pp.19-20). The second accent pattern applied to all other nouns and adjectives. In this latter group, all case forms were accented on the stem syllable with the exception of the genitive and dative plural forms which took suffixal accent. Although Voyles makes these claims early in his study, the paradigms found in the appendix reveal that the only case which consistently took suffixal accent was the genitive. The IE paradigm for ‘two’, for which all forms are naturally given in the plural, best illustrates this point (p.243)¹⁶:

(6)	nom. masc.	+ <i>dwói</i>	fem.	+ <i>dwās</i>	neut.	+ <i>dwā</i>
	gen.	+ <i>dwojōm/?ōm</i>		+ <i>dwāisōm</i>		+ <i>dwojōm/?ōm</i>
	dat.	+ <i>dwōimis</i>		+ <i>dwāimis</i>		+ <i>dwōimis</i>
	acc.	+ <i>dwóns</i>		+ <i>dwās!/?ns</i>		+ <i>dwās</i>

2.3.3 Adverbs

Since adverbs were typically derived from the oblique case of nouns and adjectives, they received accent on the suffix (Voyles 1992: 20), e.g., Go. *triggwa* ‘covenant’ and *triggwaba* ‘truly, assuredly’.

In light of these details on IE accent placement, a closer examination of the relationship between accent and GV can now be undertaken.

3.0 Accent and differential syllabification

3.1 Correlating accent and GV

The search for a possible link between GV and PIE word accent is not without precedence. The earliest explanations posited for GV attempted to

¹⁶Although I subscribe to the reconstruction of this stem with a laryngeal, e.g. +*duoh₁* (Beekes 1995: 214) or +*dwoXw* (Lehmann 1952: 45), the paradigm in (6) above from Voyles, nevertheless, serves to illustrate that the genitive case is the most consistent with regard to placement of accent on the inflectional suffix.

implicate accent as the motivating factor behind the phenomenon (Collinge 1985: 94). Holtzmann was the first to hypothesise that the syllable following the GV segments was accented (as cited in Collinge 1985; based on Holtzmann 1870). Later, Kluge (1913: 75) argued that the opposite environment, namely a preceding accented syllable, was responsible for GV. An examination of the paradigms provides insight as to whether accent could have played a role in GV. Of particular interest are the paradigms which include both GV and non-GV forms.¹⁷ These paradigms may shed light onto the original state of affairs at the time of GV before levelling obscured the “conditioning” environment. The paradigm for ‘two’ is one such paradigm. The potentially high frequency of the word ‘two’ may have helped this paradigm resist levelling thus enabling better insight into the GV conditioning environment. In light of the plurality/duality denoted by the number ‘two’, the paradigm only contains plural forms.

(7) ‘two’

a. **Gothic** (from Wright 1917: 117)

	Masc.	Fem.	Neut.
N.	twái	twōs	twá
G.	twaddjē	----- ¹⁸	twaddjē
D.	twáim	twáim	twáim
A.	twans	twōs	twá

b. **Old Norse** (from Noreen 1970: 304)

	Masc.	Fem.	Neut.
N.	tueir	tuær	tuau
G.	tueggia	tueggia	tueggia
D.	tueim	tueim	tueim
A.	tuā	tuær	tuau

In both the Gothic and Old Norse paradigms, GV is limited to the genitive case. The same restricted occurrence of GV to the genitive case is found in the Old Icelandic paradigm for ‘both’, i.e., *beggja* (gen.) (cf. Go. *bai* (nom.), *bans* (acc. masc.), *baim* (dat.)) (Lehmann 1986).

This begs the following question: What is the significance of the genitive form with regards to GV? Recall the IE paradigm for ‘two’ from (6). In that paradigm, the genitive case distinguished itself from the others in that it alone received accent on its inflectional ending.

This link between accent and GV is not restricted to nominal paradigms. The Old Norse verbs *hoggua* ‘to hew’ and *búa* ‘to live’ display both GV and non-GV forms in their principle parts. These verbs are shown below in (8) and (9)

¹⁷In many cases, GV has been extended through or eliminated from the paradigms by levelling.

¹⁸No such form has been attested (Wright 1917, Braune and Ebbinghaus 1981).

respectively. The key forms for the discussion are highlighted.¹⁹

(8)	<u>Root Accent</u>			<u>Suffixal Accent</u>	
		<i>Infinitive</i>	<i>Sing. Preterite</i>	<i>Pl. Preterite</i>	<i>Past Participle</i>
	ON	hoggua	hió	hiuggom	hogg(u)enn
but	OE	hēawan	hēow (preterite)		
	OHG	houwan	hīo (preterite)		
(9)	ON	búa	bió	biogg(i)am/biuggom	búenn
but	OE	būan			gebū(e)n
	OHG	bū(w)an			

The contrast between the (highlighted) GV and non-GV forms in (8) and (9) is correlated with accent placement. Recall from §2.3.1 that the infinitive (present stem) and singular preterite, received root accent. By contrast, the plural preterite and past participles were accented on their inflectional endings. The highlighted items in (8) and (9) provide another illustration of the link between GV and suffix accent.

Such a claim of suffix accent is not new. As stated above, various scholars, including Holtzmann himself, have founded their explanations on the correlation between GV and suffixal accent (cf. Austin 1946, 1958, Mikkola 1924, Polomé 1949, and H. Smith 1941). In particular Mikkola (1924: 267-8) meticulously details the position of accent in non-Germanic GV cognates to illustrate that the accent would have immediately followed the GV segments:

Ich will im Folgenden zeigen, daß der Übergang von intervokalischem *j* zu *ddj* im Gotischen und zu *ggj* im Altnordischen und von intervokalischem *w* zu *ggw* bzw. *ggv* im Gotischen und Altnordischen unmittelbar vor einer ursprünglichen betonten Silbe stattfindet. . . . Altnord. *egg* (G. pl. *eggja*), kringot. *ada*, das *ad'a* zu lesen ist, „Ei“. Die Endbetonung wird durch gr. *φόν* und slav. **ǰjé* bezeugt.²⁰

¹⁹ON *hoggua* and *búa*, as well as their West Germanic cognates, show strong similarities across the principle parts in (8) and (9). However, *hoggua* also displays GV segments in the present stem. This GV form may be the result of later levelling. The argument for levelling is supported by the fact that *hiogga* has also been noted as a possible singular preterite form in some dialects (Noreen 1970: 338). Thus, the GV segments may have been levelled throughout this verb's principle parts in some dialects. By contrast, the past participle *búenn* in (9) does not display GV where expected in comparison to *hoggua*. Since these forms are anomalous within their paradigms, I will not discuss them further.

²⁰I want to show in the following, that the transition of intervocalic *j* to *ddj* in Gothic and to *ggj* in Old Norse as well as of intervocalic *w* to *ggw* or rather *ggv* in Gothic and Old Norse takes place immediately before an original accented syllable. . . . Old Norse *egg* (gen. pl. *eggja*), Crimean Go.

For the accent to have followed the GV obstruents, then GV must have operated prior to the Germanic accent shift when the accent was still mobile. However, since correlations do not equate with causes, then the following question arises: What role did this accent play in the Germanic *Verschärfung*?

In order to determine the role of accent in GV, I now turn to an examination of the impact of accent on the syllabification of the sequence $\check{V}CGV$ in Germanic.

3.2 Differential syllabification

It is well documented that accented or stressed syllables attract segments into their heads and codas. Evidence from phonological studies, psycholinguistic experiments and historical documents support the reality of differential syllabification based on accent. I will now briefly highlight the evidence from these three sources.

3.2.1 Phonological evidence: Borowski (1990)

Borowski (1990) bases her analysis of flapping and palatalisation in American English on resyllabification. She claims that “not only does [resyllabification] draw onset consonants into the coda of stressed syllables, it must also draw coda consonants into stressed onsets” (p.337). To illustrate Borowski's argument, I provide an example from her explanation of flapping.

- (10) a. á[D]öm but a[t]ómic
 b. mór[D]ál but mor[t]áality
 c. butter [bʌDɹ]; writer [ráyDɹ]; party [párDiy]

As evident from (10), “flapping occurs obligatorily in the environment $\acute{v}_ \check{v}$ ” (p. 268). Borowski assumes an initial syllabification of V.C \check{V} which undergoes subsequent resyllabification when the accent precedes the plosive as shown in (11).

- (11)
- | | |
|--|---|
| $\begin{array}{c} \bar{\sigma} \\ \\ R \\ / \quad \backslash \\ a \quad \uparrow \\ \quad \quad [D] \end{array}$ | $\begin{array}{c} \bar{\sigma} \\ \\ O \\ \neq \\ om \end{array}$ |
| (R=rhyme, O=onset) | (from Borowski 1990: 269) |

Once located in the syllable final position, the *t* or *d* is in the critical position of weakening and thus lenites to the flap [D] (p. 269). Flapping in English, therefore, provides an example of differential syllabification based on accent placement.

3.2.2 Psycholinguistic evidence from English

Psycholinguistic experiments testing the intuitions of English native speakers with regards to syllable structure have revealed small yet reliable effects of

ada, which is to be read *ad'a*, 'egg'. The suffix (ending) accent is evidenced by Gk. *φόν* and Slav. **jāž'* (translated by L.C. Smith).

accent where a stressed syllable is “more likely to attract an extra consonant than [is] an unstressed syllable” (Treiman and Zukowski 1990: 72). Studies have also revealed that the consonantal strength of a (simplex) segment affects the “resyllabification” of onset consonants into the coda of a preceding stressed syllable (Treiman 1984, Treiman and Danis 1988, Treiman and Zukowski 1990, Derwing and Neary 1991). In sum, the weaker the consonantal strength of a segment, the more likely it will be syllabified into the coda of the preceding stressed syllable.

Thus, we see again that intervocalic segments and clusters can be differentially syllabified based on accent placement. I now briefly summarise one final piece of evidence for differential syllabification, namely word divisions in Old English manuscripts.

3.2.3 *Old English manuscripts*

Citing evidence from word divisions in Old English manuscripts compiled by Lutz (1985, 1986), Vennemann (1988: 59) states, “Evidently an accented first syllable tends more strongly to attract part of the cluster toward itself than an unaccented first syllable, and the resulting difference in syllabication is reflected in the different division ratios”. These conclusions are based on the tendencies for word division as exemplified by (12).^{21, 22}

(12)	a.	<i>noedrV-</i> (—x)	d/r 12x	/dr 1x
	b.	[xx]—xx	d/r 4x	/dr 7x

When the accent immediately preceded a cluster as in (12a), then the cluster was typically heterosyllabified. However, when the accent did not fall on the vowel immediately preceding the cluster, then the cluster tended to be tautosyllabified in head position of the second syllable as in (12b). Thus, according to the word division of Old English manuscripts, accent played a role in the differential syllabification of intervocalic clusters.

3.3 *Differential syllabification in Early Germanic and GV*

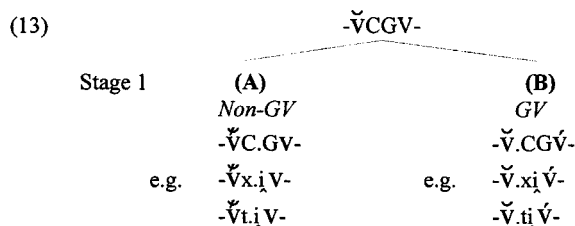
As I have attempted to show above, differential syllabification of medial clusters can result from variable accent placement. If we recall that Germanic experienced a period of mobile accent following its departure from IE, then it may be possible that differential syllabifications of word medial clusters may have arisen during the early stages of Germanic. Since the occurrence or non-occurrence of GV appears to be correlated with accent placement, then it appears possible that two separate syllabifications arose in the etymon from which the GV and non-GV developments proceeded, namely one based on suffix accent (GV producing), the

²¹I cite Vennemann’s (1988: 59) format for the presentation of the data in (12). In (12a), the accent immediately precedes the cluster. By contrast, although the accent precedes the cluster in (12b), it does not do so in the immediately preceding syllable, e.g., *wéredre* and *unfulfrémedre*.

²²Gothic is another language where word divisions in manuscripts have been cited as providing insight into the syllabification of a language (cf. Hechtenberg Collitz 1906, Vennemann 1985b).

other based on root accent (non-GV producing).

We must next determine which sequence could have produced the differential syllabifications implicated in GV according to the hypothesis above. A number of linguists have argued that GV arose when the implicated glide was preceded by a laryngeal as in the cluster *-HG-* (H. Smith 1941, Austin 1946, 1958, Polomé 1949). This claim is supported by reconstructions for the PIE roots of the GV reflexes, e.g., Go. *glaggwō* < PIE **ghleH₂-*, Go. *daddjan* < PIE **dhoH₂-*, etc. Moreover, since GV purportedly occurred following a short vowel (cf. §1.1), then the relevant sequence for our purposes is *ṽCGV*, and in particular *-ṽHGV-*. A possible output of the differential syllabification of these sequences is illustrated below in (13).²³



H represented by [x]; non-laryngeal segment represented by [t]; *G* represented by [i]

The syllabifications (A) and (B) would have arisen during what I will refer to as Proto-Germanic Stage 1 when accent was still mobile prior to the Germanic accent shift. When the accent preceded the medial cluster, *-C₁C₂-*, as in (A), it attracted the first consonant of the cluster, *C₁*, into the coda of the previous syllable (cf. §3.2). By contrast, when the accent followed the cluster as in (B), then *C₁* was attracted into the head position of the second syllable. Thus, the accent pulled medial consonants into the accent bearing syllable. These syllabifications are in harmony with Polomé's (1949: 183) original analysis in which he contends "that the laryngeal regularly belongs to the syllable which bears the stress."

Modern English provides parallels to this accent-based differential syllabification. For example, the pair *a.ttráctive* and *át.rophy* illustrates the effects of accent placement on syllabification. A preceding accent results in the heterosyllabification of clusters as in *át.rophy*. Conversely, clusters are tautosyllabified in the onset of a following accented syllable, e.g., *a.ttráctive*. Thus,

²³Although I note that the relevant sequence for our purposes contains a short vowel as in (13), the sequence *ṽHGV* would also have been syllabified as *ṽ.HGV* regardless of accentuation since word medial clusters were generally syllabified in the onset of the following syllable when the preceding vowel was long (cf. Treiman and Zukowski 1990:76). We could then expect that this sequence may have also undergone GV as Kluge (1913) first suggested. However, I am unaware of any such examples at this time.

the differential syllabification proposed in (13) is supported by modern English.²⁴

Further support for the (A) syllabification in (13) comes from Murray and Vennemann (1983) and Murray (1988, 1991, 1993). This syllabification, $\check{V}C.Gv-$, is precisely what they reconstruct for Proto-Germanic to provide a cogent analysis of some of the major phonological developments, including Gothic glide strengthening, West Germanic gemination, North Germanic resyllabification and Sievers' Law. However, this syllabification is reconstructed for the period of Germanic following the accent shift to the root syllable vowel and therefore cannot account for the syllable structure of (13B) which could only have arisen during the period of mobile accent in Germanic (cf. §6 for an overview of the development of Proto-Germanic syllable structure based on the development of the accent system in Germanic). Nevertheless, Murray and Vennemann concede that the syllabification of Germanic was very marked. The differential syllabification in (13) would further prove this to be the case.

I now turn to my analysis of the sound changes involved in the development of both GV and non-GV forms. I will show how the differential syllabification of $\check{V}HGv-$ set up the conditions for the variable development of GV and non-GV items. All sound changes which I will propose will be based on the Preference Laws for Syllable Structure. I will commence my analysis by examining the GV sound changes before turning to a discussion of how the non-GV forms developed from the (13A) syllabifications.

4.0 The development of GV forms

That the GV forms may have potentially developed from the syllabified sequence $\check{V}HGv-$ correlates with the fact that the PIE accent appears to have fallen on the inflectional suffix in the GV forms. The analysis which I propose in this section, therefore, will assume this syllabification. The sound changes which I will implicate are simple: first, voicing of the laryngeal by Verner's Law and secondly, subsequent slope steepening as a means to improve a less than preferred syllable onset in accordance with the Head Law (cf §4.3 (15)). I will contend that it was the laryngeal and NOT the glide which strengthened as has generally been claimed. However, before I commence my analysis of the GV strengthening, I will first differentiate between the sequences $\check{V}HGv-$ and $\check{V}Hv-$ to eliminate any question as to why this latter sequence did not also undergo GV.

4.1 Laryngeals and GV^{25}

Although laryngeals were arguably maintained during at least the earliest stages of Germanic before being ultimately "lost", they were not maintained equally in all environments. It is believed that laryngeals persisted longer when contiguous to a glide than when they were not (cf. §2.1). Consequently, laryngeals would have been maintained longer in the sequence $\check{V}HGv-$ than in $\check{V}Hv-$ where no resonant was present. This maintenance represents a type of strengthening since the

²⁴Thanks to Robert Murray who brought my attention to these examples.

²⁵Laryngeals will be represented in examples as the voiceless velar fricative [x].

laryngeal was for some reason able to resist loss in this environment. It may then be plausible that GV operated following the loss of laryngeals in the string *-VHV-*, but while laryngeals were still extant when contiguous to glides. I now turn to a discussion of GV from this latter sequence.

4.2 *Verner's Law and GV*

During the period of mobile accent in Germanic, Verner's Law caused the voicing of all voiceless fricatives in a voiced environment which were not directly preceded by an accent. Consequently, all word medial voiceless fricatives of the (13B) syllabification became voiced, e.g. PIE *+pətér* 'father' > *+faþár* (Grimm's Law)²⁶ > Go. *faðar* (Verner's Law). If we assume that laryngeals were voiceless fricatives, we would then also expect them to have undergone the voicing of Verner's Law as shown below in (14):

(14) $-\check{v}.x_i \acute{V}- > -\check{v}.y_i \acute{V}-$ (voicing due to Verner's Law)

Thus, we would expect the laryngeals to have behaved as the other voiceless fricatives by also undergoing voicing in this environment.²⁷

Two issues arise at this point. First, why was the sequence $-\check{v}.y_i \acute{V}-$ alone responsible for GV? And secondly, how did this sequence produce the GV forms? These issues can be resolved following upon examination of the relevant Syllable Preference Laws and the Consonantal Strength Scale of Murray and Vennemann (1983).

4.3 *GV as a syllable structure motivated sound change*

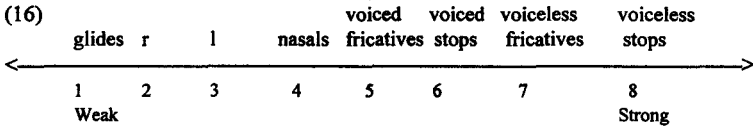
By virtue of its composition, the sequence $-\check{v}.y_i \acute{V}-$ is subject to the Head Law found in (15).

(15) *Head Law*: A syllable head is the more preferred: (a) the closer the number of speech sounds in the head is to one, (b) the greater the Consonantal Strength value of its onset, and (c) the more sharply the Consonantal Strength drops from the onset toward the Consonantal Strength of the following syllable nucleus.

The Consonantal Strength of the segments in $-\check{v}.y_i \acute{V}-$ can be determined from the Consonantal Strength Scale in (16).

²⁶Grimm's Law is responsible here for *p>f* and *t>b*.

²⁷This line of argumentation would not be undermined if there were voiced laryngeals in Germanic. The voicing of the voiceless laryngeals would simply have rendered them identical to the voiced series in precisely this environment. Thus, it could be argued that the voiced laryngeals, whether inherited or derived by Verner's Law, subsequently underwent the same developments from this stage forward.



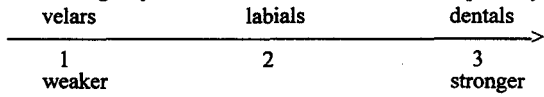
An examination of part (c) of the Head Law in (15) reveals that the syllable head y_i forms the least preferred of the *obstruent+glide* onsets (cf. §4.3.1). This aspect of the Head Law refers to Slope, the difference in the Consonantal Strength of A-B where .AB form an onset cluster. According to the Head Law, the greater the slope of a cluster the more preferred the syllable head will be. Thus, the onset, $.t_i$, would be more preferred than $.y_i$.

4.3.1 *Determining the preference of y_i*

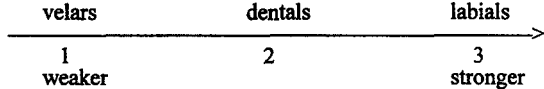
The relative strength of [y] and therefore the relative preference of y_i with regards to other *obstruents+glide clusters* can be determined more precisely based on place of articulation. Gamkrelidze (1981) claims that the voiced velar plosive [g] is more marked and therefore weaker than both [d] and [b]. His conclusions are based on the universal distribution of these phonemes such that the more marked a segment is, the less likely it will occur in the world's languages.

Foley (1977) approaches this question from a different perspective. He claims that the relative strength of segments can be determined based on their tendency towards lenition across languages. Focussing specifically on the tendency of Germanic and Romance segments to lenite, Foley arrives at the following conclusions:

(17a) *Relative strength of consonants in Germanic based on place of articulation*



(17b) *Relative strength of consonants in Romance based on place of articulation*



(Based on Foley 1977: 145)

In both Romance and Germanic, the velar articulation is found to be the weakest place of articulation. This concurs with Gamkrelidze's findings. These conclusions support claims of the professed weakness of laryngeals in comparison to other

Since voiced fricatives comprise the weakest natural class of obstruents with regards to consonantal strength, then it follows that its weakest member, namely the voiced velar fricative γ , would be the weakest obstruent. As the weakest obstruent, therefore, it would form the least preferred slope in the cluster γ_1 as depicted in (18). By contrast, t_1 would form that most preferred onset where t has the greatest consonantal strength of the Germanic obstruents.

According to the Diachronic Maxim, the less preferred structures are the first targeted to undergo improvements or changes.

- (19) *Diachronic Maxim*: Linguistic change on a given parameter does not affect a language structure as long as there exist structures in the language system that are less preferred in terms of the relevant preference law (Vennemann 1988: 2).

As the least preferred onset cluster, γ_1 would be expected to be the first targeted for changes. This answers the first question: Why were the sequences with the laryngeal reflexes the only sequences to undergo GV? This leaves the last question: how was the slope of the *HG* sequence improved?

4.4 Slope steepening

Complex syllable heads can be improved by means of several possible repair strategies. These include deletion of one of the cluster consonants, anaptyxis, vowel prothesis and slope steepening. The only process that neither deletes nor adds segments to the structure is slope steepening. This process simply ameliorates a poor slope by either strengthening the first consonant of the cluster, C_1 or weakening the second consonant, C_2 .

The Romance languages provide numerous examples of slope steepening. Here the slope of either word initial or medial clusters is augmented by the weakening of the second consonant.

- | | | | |
|------|---------------|--------------------------|-------------|
| (19) | Lat. plānum | It. p ₁ iano | 'floor' |
| | Lat. tem.plum | It. tem.p ₁ o | 'temple' |
| | Lat. placēre | Por. prazer | 'to please' |

When the slopes of the examples in (19) are placed on a preference continuum, then it becomes apparent as to how the slope has been ameliorated in each case.

- (20)
- | | | | | |
|---|----------------|-----|-----------------|---|
| ← | .pl | .pr | .p ₁ | → |
| | less preferred | | more preferred | |

Since C_1 was already the strongest consonant, namely a voiceless bilabial plosive (cf. (17b)), then the only means of improving the slope was to weaken the C_2 .

The converse is found in Germanic. In one example, the C_2 in the Standard Norwegian cluster *hu* underwent unconditional strengthening from $u > v$ in West Norwegian dialects. The resulting cluster, *hv*, would have been a very poor onset

cluster thereby necessitating the strengthening of the first consonant, C_1 . This change of $h\mu > kv$ is illustrated in (21).³¹

(21)	WNor. kvat kvitur	StNor. huat hufr	‘what’ ‘white’
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Thus, the strengthening of $h > k$ would have improved the slope of the onset cluster.

This example from West Norwegian provides an excellent parallel to the situation in early Germanic. The slope y_1^i could only be improved by strengthening the C_1 since as a glide the C_2 could not be weakened further without becoming vocalic. Thus, the only means of ameliorating the slope of this cluster was to increase the consonantal strength of the voiced velar fricative, $[ɣ]$, to that of a voiced velar plosive, $[g]$.

(22)	$y_1^i > g_1^i$	Slope Steepening
------	-----------------	------------------

Although slope steepening only augmented the Consonantal Strength of C_1 by one step on the Consonantal Strength Scale, this increase would have resulted in a sufficient slope improvement thereby rendering it a more preferred syllable onset than its etymon.

4.5 A sample derivation

The development of the GV forms can thus be summarised as follows:

(23)	a.	$-\check{V}.x_1^i \check{V}-$	
	b.	$-\check{V}.y_1^i \check{V}-$	Verner’s Law
	c.	$-\check{V}.g_1^i \check{V}-$	Slope Steepening — Head Law

As shown in (23), GV can be traced back to the sequence $-\check{V}.x_1^i \check{V}-$. The series of changes can be summarised simply as follows: First, voiceless laryngeals were voiced by Verner’s Law. Since the resulting voiced velar fricative + glide onset cluster formed the least preferred according to the Head Law, the slope of this cluster was improved through slope steepening whereby the consonantal strength of C_1 was increased. The sum result were the GV clusters, namely $[g_1^i]$ and $[g\mu]$.³² A

³¹The same slope steepening is evidenced today in Modern Icelandic, e.g., *hvað* ‘what’ commonly $[kvað]$, less commonly $[xvað]$ (Glendening 1993).

³²These results can be reconciled with my interpretation of the GV segments (cf. Footnote 1):

Go.	$\langle ddj \rangle = [d_j]$ (or $[dd_j]$)	ON	$\langle ggj \rangle = [gg^i_j]$
	$\langle ggw \rangle = [g\mu]$ (or $[gg\mu]$)		$\langle ggw \rangle = [gg\mu]$

In Gothic, the velar plosive in $[g_j]$ could have assimilated to the palatal glide resulting in either $[d_j]$ or $[j_j]$ which would correspond to Wulfila’s $\langle ddj \rangle$. In the event that the pronunciation was indeed $[j_j]$, the palatal plosive may have been perceived as an allophone of $/d/$ since no palatal series existed in Gothic. The cluster $[g\mu]$ may then have simply been adapted without any further developments. In Old Norse, the velar plosive would have undergone velar gemination producing the geminates found there as in $[gg_j]$ and $[gg\mu]$. This gemination was responsible for the velar geminates

sample derivation of Go. *bluggwans* is shown in (24).

(24)	PIE	+bhliHw - ón ³³	Root+past participle ending — Suffix accent
			Loss of laryngeals when no contiguous glide
		bhlV.xuǵv̆n	Syllabification (B) (H=x)
		blV.xuǵv̆n	Germanic Consonant Shift (<i>bh</i> > <i>b</i>) ³⁴
		blV.yuǵv̆n	Verner's Law
		blV.guǵv̆n	Slope steepening
		blV.guǵv̆ns	Miscellaneous developments
		[bluggwans]	<bluggwans>

The derivation in (24) is based on a reconstructed PIE stem and inflectional ending. Since the accent fell on the suffix in the past participle, the cluster *xu* would have been tautosyllabified in the onset of the accent bearing second syllable. Next, since the accent was not directly preceding the laryngeal, then the laryngeal would have undergone voicing due to Verner's Law. The lenition of *xu* to *yu* would have thus rendered the cluster the least preferred syllable onset. As such, the onset would have been the first to be targeted for improvement, whereby the slope was increased by strengthening the velar fricative to a voiced velar plosive. The output of this series of changes was ultimately Holtzmann's Law.

4.6 A question of chronology

One question could be posed at this stage as to whether the sequence of changes *x > k > g*, rather than *x > y > g*, could have been responsible for the development of the GV segments? This alternative series of changes would presuppose the chronology slope steepening followed by voicing. Although at first blush, this chronology seems another possible explanation of events, one particular problem causes me to discard this as a likely alternative.

The principle weakness of the alternative chronology lies in the second phase of the change, *k > g*. Voicing of the plosive cannot be attributed to Verner's Law since it applied strictly to fricatives. Although the intervocalic environment is a typical voicing environment, this particular change is not commonly found in Germanic. More to the point, however, is that the direction of change, *k > g*, is not attested in Germanic. According to Noreen (1970), Old Norse *g* has only two sources, Proto-Germanic *ǰ* and *g*. By contrast, Old Norse *k* has a number of sources including *g* from Proto-Germanic. All things being equal (ie., if we disregard the laryngeals as a potential source of either phone), then the expected direction of

elsewhere in Old Norse such as in the words *leggja* (Go. *lagjan* 'to lay down'), *huggia* (Go. *hugjan* 'to think'), and *bekkr* 'stream' (Noreen 1970: 203). Subsequently, the palatal glide would have triggered palatalisation of the velar further producing [gg̊j].

³³The reconstruction of the root, +bhliHw is based on Schrijver (1991). The past participle ending is found in Voyles (1992). To avoid any possible dispute regarding the chronology of vocalic changes, I will use V to represent the vowels until the output of the derivation.

³⁴The exact position of Grimm's Law is inconsequential as long as it precedes Verner's Law.

change would be $g > k$, not the requisite $k > g$ for this alternative series of changes. Even if Proto-Germanic k could be argued to be the source of GV g , it could not explain why numerous examples of kG did not also develop into gG in the dialects, e.g., Go. *brakja* ‘struggle’ beside Oldcel. *brakan* ‘creaking’; Go. *us-wakjan* ‘wake up’, Oldcel. *vekja*, OS *wekkian*, OGH *wecchen* and OE *weccan* ‘to cause to wake up’. In light of the evidence against $k > g$, I am not convinced that this development could serve as a preferable alternative to the chronology suggested and argued for earlier in this paper. I therefore continue to assume the GV development $x > \gamma > g$.

Having accounted for the GV developments, I now turn to an examination of the non-GV developments.

5.0 Non-GV developments³⁵

Parallel developments have in some cases produced both GV and non-GV reflexes. Examples below in (25) illustrate these parallel developments.

(25) Parallel developments

GV	Non-GV	WGmc.
Go. <i>triggwa</i> ‘covenant’	<i>trauan**</i> ‘to trust’	OE <i>trūwian</i> OHG/OS <i>triuwi</i> ‘trust’ OHG <i>trū(w)ēn</i> ‘to believe’
ON <i>tryggua</i> ‘to make calm’	<i>trū</i> ‘belief’ <i>trūa</i> ‘to trust’	
Go. -----	<i>hawi</i> ³⁶ ‘hay’	OHG <i>houwan</i> OFris. <i>hāwa</i> ‘to hew’ OS <i>gi-ho(u)wan</i> ‘hewn’ (p.p.)
ON <i>hoggua</i> ‘to cut’	<i>hey</i> ‘hay’	

In §3 I argued that the principle difference between the non-GV and GV forms in paradigms such as ‘two’ was accent placement, and by consequence the differential syllabification of the medial cluster *HG*. Since the accent in the non-GV forms appear to have fallen on the preceding root vowel, I proposed that the non-GV forms developed from the (A) syllabification, namely $\check{V}H.GV$. In what follows I will present an analysis for the development of the non-GV forms based on a similar change in Proto-Germanic.

5.1 Accounting for the non-GV developments: Assimilation

An explanation of the non-GV forms must be able to account for the two possible non-GV outputs, namely those containing geminate glides and those

³⁵In some cases, non-GV cognates may have developed from a different ablaut grade. However, I will focus primarily on the non-GV cognates which may have developed from the same root. Evidence of differing development from one common IE form, one need only look at the paradigm ‘two’ (cf. (7)).

³⁶The exact explanation for the Gothic short vowels is unknown. Perhaps these forms developed from a different ablaut grade or from different stem allomorphy.

containing long vowels:

- | | | |
|------|--|------------------------------|
| (26) | <i>Geminate glides</i> | <i>Long vowels</i> |
| | OHG <i>zwei</i> jo (<i>i i</i>) 'of two' | OE <i>būan</i> , 'to dwell'. |
| | OHG <i>glouwer</i> (<i>yu</i>) 'clear' | OHG <i>bū(w)an</i> , |
| | OHG OS <i>triuwi</i> (<i>yu</i>) 'trust' | ON <i>būa</i> |

One possible explanation which could be cited would be coda weakening due to the inherent weakness of the laryngeals.³⁷ However, this does not take into consideration the poor syllable contact, *H.G*, according to the Contact Law, which states:

- (27) A syllable contact A.B is the more preferred, the less the Consonantal Strength of the offset A and the greater the Consonantal Strength of the onset B; more precisely — the greater the characteristic difference CS(B)-CS(A) between the Consonantal Strength of B and that of A (Vennemann 1988: 40)

Moreover, coda weakening would not necessarily guarantee that the laryngeal would weaken to the same glide as what appears in the following onset.

Assimilation offers a more plausible solution to the problem. The syllable contact in the sequence $\check{V}HG\check{V}$ is poor. Although the laryngeal is weak, its Consonantal Strength is still slightly greater than that of the following glide (cf. (16)). Assimilation would repair the poor contact by removing any difference in Consonantal Strength between the two segments.

- (28) - $\check{V}H.G\check{V}$ -
 - $\check{V}G.G\check{V}$ - complete, regressive, adjacent assimilation

Assuming assimilation as the primary means of repairing the contact and eliminating the laryngeal is supported by the Strength Assimilation Law which states that "if Consonantal Strength is assimilated in a syllable contact, the Consonantal Strength of the stronger speech sound decreases" (Vennemann 1988:

³⁷The series of lenitions, $k > x > \chi > h > \emptyset$ underscores the relatively weak Consonantal Strength of these phones. The change $x > h > \emptyset$ has been attested in Germanic (e.g., OE *hwæt* > Eng. *what*, OE *sēon* 'to see' beside OHG *sehan* and Go. *saih an*) and elsewhere (OSpa. [x]*ablar* 'to speak' > Spa. *ablar* (adapted from Murray 1995)). There is then reason to place the phones [h] and [χ] between the glides and liquids on the Consonantal Strength Scale based on the weakness of these phones (Robert Murray, p.c.). If we employ Foley's (1977) criteria that relative strength is based on the relative tendency to lenite, then the laryngeals would be extraordinarily weak. Moreover, the basic assumption of the laryngeal theory is that these segments were ultimately lost by some means in the daughter languages of IE (cf. Lehmann 1952, Jonsson 1978, Beekes 1988, etc.). That the laryngeals were so "easily" lost in all IE dialects would further support the notion of a very weak Consonantal Strength.

35). Moreover, this change is in harmony with similar changes at work elsewhere in Proto-Germanic. Numerous examples of other occurrences of assimilation in the pre-history of Germanic can be cited from Vennemann (1988: 38-9):

- (29) a. ***d.l > l.l, ll, l**
 *mad.la- > *mal.la-;
 Grm. and Lat. *mallus* 'law court', *mallare* 'to accuse, prosecute';
 *stad.la- > +stal.la;
 ON *stallr*, OE *steall*, OHG *stal*, *stalles* 'stall, stable'
- b. ***z.l > l.l, ll, l**
 *hruz.lan > *hrul.lan;
 OIcel. *hrolla* 'to tremble, shiver'
- c. ***z.m > *m.m, mm, m**
 *cz.mi > *em.mi;
 Goth. *im* '(I) am'

Thus, complete regressive adjacent assimilation was already in operation elsewhere as a means of repairing poor contacts. Such a proposal for the non-GV data is then in harmony with explanations of other phenomena in Proto-Germanic.

A derivation of the OHG *bliuwan* 'to strike' illustrates the development.

- (30) *bhliH.ɥan³⁸
 bliH.ɥan First Germanic Consonant Shift (Grimm's Law)
 bliɥ.ɥan³⁹ Complete, regressive assimilation
 <bliuwan>

This derivation provides evidence against loss of the laryngeal through lenition. Since this loss would have triggered compensatory lengthening as has been noted in Indo-European, then it could not account for the appearance of the <u> in this and other similar examples.⁴⁰ Only by assuming the complete assimilation of the

³⁸Reconstruction of the root *bhliH-w comes from Schrijver (1991). I have employed the infinitival ending commonly found in Old English, Old High German, Old Saxon, etc. for ease of explanation.

³⁹This verb may have undergone a further step where the coda glide was vocalised. Such a development would not detract from this explanation, but in fact could help provide support since the appearance of the vowel [u] could not be explained by any theory of straight laryngeal deletion.

⁴⁰To illustrate the advantage of an explanation based on assimilation rather than compensatory lengthening, we need only examine the derivation of *bhliH.ɥan based on compensatory lengthening.

*bhliH.ɥan
 bliH.ɥan First Germanic Consonant Shift
 bli.ɥan loss of laryngeal
 blii.ɥan compensatory lengthening
 *bliɥan *bliɥwan

laryngeal to the following glide can this <u> receive a proper explication. Other examples of non-GV items which can be accounted for based on this change include among others OHG *zweiio* 'of two', *glouwer* 'intelligent', *triuwi* 'trust', *triuwa* 'faith', *eigir* [ejjir] 'egg, pl.', MHG *riuwe* 'sadness, worry', *briuwen* 'to brew', OS *gibreuuan* 'brewed', and ON *hey* 'hay'.

This analysis can also be extended to account for items such as ON *būa* and OE *trūwian*. The appearance of long vowels in these forms could be the result of the subsequent coalescence of *u̯* > *ū*. Prokosch (1939: 105) states that the first element of a diphthong tended to absorb the glide when the diphthong was stressed. Since stress was indeed on the resulting diphthong, then the environment existed wherein this coalescence could occur.⁴¹ The example OHG *bū(w)an* 'to dwell' in (31) illustrates this non-GV development and coalescence.

(31)	*bheH.ɥan	'to live, dwell'
	bhuH.ɥan	Vowel gradation due to laryngeal
	buH.ɥan	First Germanic Consonant shift
	buɥ.ɥan	Complete regressive assimilation
	bu:ɥan	Coalescence
	<būwan>	

The long vowels in the non-GV forms can thus simply be explained as resulting from two simple changes: complete assimilation of the laryngeal to the glide and subsequent coalescence of the glide to the preceding vowel. This explanation can therefore be used to account for the forms OE *twēġ(e)a*⁴² 'of two', *snōwan* 'to hurry', OHG *scūwo* 'shadow', MHG *brūwen* 'to brew', MDu. *brūwen* 'to brew', *blūwen* 'to deal blows', ON *snūa* 'to turn, twist', *brū* 'bridge', etc.

Thus, complete, regressive, adjacent assimilation of the laryngeal to the following glide provides a cogent account of the development of the non-GV forms. It can account for the two sets of non-GV items, namely those containing diphthongs, e.g., OHG *zweiio*, etc, and those containing long vowels, e.g., ON *būa*. Rather than assuming these to be the result of two separate processes, they can be considered different stages of the same development. The examples containing diphthongs would be conservative forms maintaining the geminate glides which arose from the assimilation of the laryngeal to the glide. The second set of non-GV forms containing long vowels would be innovative with regards to their vowels. Rather than simply maintaining the geminate glides, *V.G.G.*, the first glide located in the coda of the first syllable coalesced with the preceding vowel. The result was the

At times, derivation by compensatory lengthening creates incorrect forms and therefore could not account for the "geminate" glides in OHG *zweiio*, *glouwer*, *gitriuwi*, etc.

⁴¹Although coalescence is a type of compensatory lengthening in that it maintains the mora count following the coalescence of the two vowels (Robert Murray, p.c.), this is not identical to that which occurs as the result of segmental loss, such as the loss of a laryngeal.

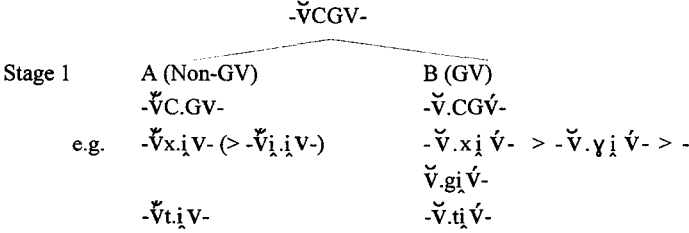
⁴²In Old English, <ġ> often represented the palatal glide [j] when followed by a palatal vowel.

long vowel found in ON *snūa*. In Middle High German, both stages of development are evidenced in its pair of forms for the verb 'to brew', *briuwen* and *brūwen*. The existence of both the conservative and innovative forms underscores the relationship between the long vowels and diphthongs in the non-GV forms. This example could be cited as support for the proposal that the long vowels simply arose as a subsequent development to the diphthongs from the assimilation.

6.0 Putting the pieces together — The development of Germanic

Although the discussion in this paper has focussed on the GV and non-GV sound changes, these developments figure into a more comprehensive development, that of Germanic. This larger development is illustrated in (32). As I proposed earlier, the parallel GV and non-GV developments took place during Stage 1 when accent was still mobile. However, when the Germanic accent shift fixed stress on

(32)



Stage 2
e.g. -ǞC.GV-◀
-Ǟx.i V-
-Ǟt.i V- ◀
-Ǟg.i V- ◀

**Germanic accent shift fixes accent on root syllable
**(B) forms conflate with (A) forms due to change in stress and therefore syllabification

the root syllable of words, the (1B) forms underwent a resyllabification to that of the (A) forms such that the initial segment of the second syllable onset was attracted into the coda of the preceding syllable. This conflation precipitated by the Germanic accent shift resulted in Proto-Germanic Stage 2. Syllabification for this second stage is supported by Murray (1988, 1993), Murray and Vennemann (1983) and Vennemann (1988) who have shown that the syllabification in Proto-Germanic Stage 2 was characterised by a very marked system cross-linguistically. Subsequent dialect specific developments such as Gothic glide strengthening, Old Norse velar

gemination and West Germanic gemination would have been a means of ameliorating this marked system.

Two points should be noted here. First, the non-GV developments could have occurred at any time during Stage 1 or early Stage 2 since the conditions for the assimilation of the laryngeal to the glide existed in both stages. By contrast, the operation of GV was limited to Stage 1 when accent was still variable. This may account for the limited number of GV forms in comparison with the more common non-GV cognates. According to the second point of chronology, laryngeals would have been completely lost either through assimilation or strengthening before the split of the dialects.

7.0 Summary

The analysis I have presented in this paper comes to the following results for both the GV and non-GV developments. First, the mobile accent which persisted during the early stages of Germanic may have led to the differential syllabification of the sequence *VHGV*. GV may have developed from the syllabification *V.HGV* which would have arisen when the accent fell on the vowel following the cluster, *HG*. The GV segments could then have resulted from two attested changes: Verner's Law (e.g., $\text{xG} > \text{yG}$) and slope steepening in accordance with the Head Law ($\text{yG} > \text{gG}$). By contrast, the non-GV forms may have developed from the syllabification *VH.GV* when the accent fell on the preceding vowel. As stated by the Strength Assimilation Law, the laryngeal could then have completely assimilated to the weaker consonantal strength of the following glide, producing forms such as MHG *briuwen*. In some cases, the resulting glide coalesced with the preceding vowel resulting in a long vowel as in MHG *brūwen*.

This analysis has three significant strengths. First, it accounts for the parallel developments of GV and non-GV forms Germanic which have typically been ignored in the preponderance of earlier theories. Secondly, it accounts for the "loss" of laryngeals in Germanic following its departure from PIE by either assimilation or strengthening. And finally, this analysis combines various documented factors and changes such as mobile accent, Verner's Law and slope steepening, in a novel way to explain this old problem.

A number of implications fall out from the analysis presented in this work. First, this analysis assumes that GV took place at an intermediate stage between the split of Germanic from PIE and the fixing of the Germanic accent on the root syllable. Consequently, this means that the syllable structures reconstructed by linguists such as Murray and Vennemann to account for subsequent dialect specific changes can only account for the stage of Germanic following the accent shift to the root syllable. This raises the question as to where other changes such as Siever's Law and the Germanic sound shifts fit into the puzzle. Further study will be necessary to provide answers to these queries.

One further implication regarding the genealogy of Germanic may be cited. Whereas the traditional assumption has held that only Gothic and North Germanic underwent GV, my analysis states the opposite. Like Davis and Iverson (1996), I claim that the occurrence of GV was not restricted to Gothic and Old Norse.

According to the analysis presented in this work, GV occurred during an early stage of Proto-Germanic. Despite past claims that West Germanic did not undergo the strengthening of GV, I have attempted to provide evidence for GV reflexes in this branch, e.g., OE *trugian*, OE *mycg*, OS *muggia*, OHG *mucca*, OS *bruggia* and OHG *brukka*. These examples appear to support the claim that GV operated before West Germanic parted company with the other branches of Germanic. The paucity of GV data in West Germanic may be the result of levelling out the majority of GV forms or derivation of new lexical items in favour of the non-GV stems.

It appears, thus, that the “fuss” over sixteen words is no fuss after all. With the genealogy of the Germanic languages at stake, GV has a lot to say.

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**Chickens and Eggs:
The Undying Issue of the Primacy of *r/l* or *z/š* in Altaic Historical Linguistics**

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Abstract

For the better part of this century, the Turkic language family has posed some difficulties for both typological and historical linguistics. The pivotal issue lies with four modern Turkic phonemes /*r*, *l*, *z*, *š*/ and their reflexes in the peripheral Turkic language Chuvash, spoken south of Moscow along the Volga River. Historically, the question that arises is, which set of phonemes, greater-Turkic or Chuvash, is the older one? And, in turn, what does the potential answer have to say about the classification of Turkic? The Chuvash reflexes /*r*, *l*/ (but not *z* and *š*) correspond perfectly with cognates in Mongolian and Manchu-Tungus languages, leading one to believe that not only are the Chuvash phonemes older, but also that Turkic is most certainly an Altaic language. The aim of this paper is to explore each side of the Altaic argument with the issue of the phonemes serving as the focal point.

1.0 Introduction

The study of historical Turkish and Altaic has been dominated for the greater part of this century by the phonological issue of rhotacism/lambdacism vs. zetacism/sigmatism. This issue is important for several reasons. First of all, the question of whether *r* or *z*, and likewise *l* or *š*, is primary is pivotal to classification, both of the modern languages and their ancestors. Secondly, deciding on one or the other, of course, will allow linguists to continue reconstructing with confidence, whereas now their reconstructions are seriously hampered by not knowing which sound is more appropriate to posit where. Making the decision as to which sounds came first, however, has proven, thus far, to be an insurmountable task.

Within turkological historical linguistics there are basically two camps: those who believe in the Altaic linguistic family, and those who believe that Turkic is a family unconnected to Mongolian or Manchu-Tungus. Part of the problem is that written records in Turkic can, with certainty, only be dated back to 720^{AD} (Handbuch der Orientalistik:5). This recent date is severely dwarfed by the earliest written records of Indo-European (IE), which extend back at the very least 1000 years before Christ. But if we believe that Turkic is an Altaic language, then we can add Old Korean¹ written records, which date

¹Presuming of course, that we also believe that Korean and Japanese are Altaic languages, a classification which is controversial.

back to ca. 57bc. This would certainly help matters, but is almost equally problematic because the OKor. records were written with Chinese phonograms (Miller 1996: 160). The aim of this paper is to outline the issue of which came first, *r* and *l*, or *z* and *ʃ*, presenting the issue from both sides, and taking into account the problems that exist for each argument, as well as the ramifications for the idea of Altaic unity.

2.0 Classification

2.1 If one is a supporter of the Altaic language family, then one usually includes the following families of languages in their classification:

Turkic, which includes Turkish proper, Azerbaijani, Kazakh, Uzbek, Turkmen, Kirghiz, Tatar, Uighur, Saxa (Yakut), Chuvash, and Volga Bulgar

Mongol, which includes Buryat, Kalmuck, Mongolian

Manchu-Tungus, which includes Manchu, Evenki, Lamut, and Tungus

Japanese (controversial)

Korean (controversial)

The greater Altaic language family extends like a belt under the belly of Russia, from the Asiatic to the Pacific, but all of the languages are believed to have originated from the area about the Altai mountains (hence Altaic), located in present-day Mongolia. From there, the ancestors of the modern Turks spread out, moving West during several different migrations, including, possibly, the Turkish soldiers in the employment of Jengis Khan of the Mongol Empire.

Most important for our purposes, is the linguistic evidence which points to the close relationship of the families. All of the languages of the families in question are agglutinative, in contrast to some of the language families which surround them, IE², and Chinese for example. There are also many similarities between the languages, not only lexically, but also morphologically and syntactically. While a similar lexicon can easily be brushed off as the result of borrowing between languages, it is much more difficult to argue that integral aspects of a language's grammar, such as morphology and syntax, are the result of borrowings. An example of the strikingly similar morphology within Altaic is evidenced in the following table:

² Although early IE may well have been agglutinative (Dr. M. Dobrovolsky, personal communication: Dec. 1997)

	<u>Turkic</u>	<u>Mongolian</u>	<u>Manchu-Tungus</u>
1 pers. sg.	<i>bi / män</i> ³	<i>bi / min-</i>	<i>bi / min-</i>
2 pers. sg.	<i>si / sän-</i>	<i>ti / tin-</i>	<i>si / sin-</i>
3 pers. sg.	<i>i / in-</i>	<i>i / in-</i>	<i>i / in-</i>
1 pers. pl.	<i>biz</i>	<i>ba / man-</i> (excl.)	<i>büa</i> (excl.)
		<i>bida</i> (incl.)	
2 pers. pl.	<i>siz</i>	<i>ta / tan-</i>	<i>süa</i>
3 pers. pl.	<i>anlar</i>	<i>a / an-</i>	<i>ti</i>

table 1. (Adapted from Róna-Tas, 1986) Reconstructed Pronouns of the Altaic Proto-Languages

While it is certainly possible for pronouns and demonstratives to be borrowed from another language, it is most unlikely that an entire pronoun system would be borrowed, especially across three different language families. The similarity of the reconstructed pronoun systems above could be more efficiently explained by supposing a parent language from which the three families developed; an explanation which the Altaic hypothesis supports.

2.2 The Turkic languages are further divided, whether one believes in Altaic unity or not, according to various characteristics, such as geography, or as follows, phonology. The first language to diverge from the rest of the Turkic languages is Chuvash (and Volga-Bulgar, which is either Old-Chuvash, or at some point merged with it), based on it exhibiting *r* and *l* where the others have *z* and *š*, respectively. For instance, the Bulgar word for 'nine' is *taxar*, while its cognate in Oguz is *toquz*.

The rest of the Turkic languages are divided based on whether *d* or *y* appears intervocally. Medieval Kyrgyz and medieval Uigur have *adak*, for example, where medieval Kypchak and Oguz have *ayak*.

The latter group, that is, the *y*-division, is further sub-divided based on whether pre-vocalic *g-* appears or there is a zero initially. For example, where Oguz shows *kal-an*, Kazan Tatar and Kazakh show *kalgan* both meaning 'remaining'. For the purposes of this paper, the *r/l* ~ *z/š* division is the most important, so that with the exception of Chuvash and Volga Bulgar, the Turkic languages will be treated as a whole unit.

Whether Chuvash is indeed a Turkic language is itself controversial. Poppe, an Altaicist (1975) states, "In [my] opinion..., Chuvash has preserved some pre-Turkic elements and should be regarded as a language very closely related to the Turkic languages but not as a Turkic language...There must have existed two ancient dialects.

³ This example and all others like it in this table are meant to be interpreted as NOMINATIVE / OBLIQUE cases

One of them became the ancestor of Volga Bulgar and Chuvash, and the other dialect became the ancestor of the Turkic languages". Poppe makes this claim based on the assumption that an innovation occurred where Chuvash and the rest of the Turkic languages now differ, that is *r/l* ~ *z/š*. Any other differences between the two developed presumably after this important first change took place.

3.0 R's, L's, Z's, and Š's

3.1 As mentioned above, we find that Chuvash and Volga Bulgar have *r* and *l* in positions where the other Turkic languages have *z* and *š* respectively:

- (1) Turkic *z* = Chuvash *r*:
 - a) Tk. *böz* = Chu. *pir* 'cloth, linen'
 - b) Tk. *yüz* = Chu. *šér* '100'
 - c) Tk. *qaz-* = Chu. *xr-* 'dig'

- (2) Turkic *š* = Chuvash *l*:
 - a) Tk. *taš* = Chu. *čul* 'stone'
 - b) Tk. *-mš, -mš* (as in *almš* '60', *yetmš* '70') = Chu. *-mäl, -mél* '10' (as in *utmäl* '60', *šimél* '70')

This same *r* and *l* in Chuvash and Volga Bulgar, in some other instances also correspond to a Turkic *r* and *l*:

- (3) Turkic *r* = Chuvash *r*:
 - a) Tk. *kara* = Chu. *xura* 'black'
 - b) Tk. *urt* = Chu. *pürt* 'hut, tent'
 - c) Tk. *gör-* = Chu. *kur-* 'see'

- (4) Turkic *l* = Chuvash *l*:
 - a) Tk. *balık* = Chu. *pulš* 'fish'
 - b) Tk. *elma* = Chu. *ulma* 'apple'
 - c) Tk. *oğul* = Chu. *ıväl* 'son'

It was these phonemic correspondences between Chuvash and Turkic cognates which sparked the debate of the primacy of *r/l* or *z/š*. One pair of phonemes in Chuvash, */r, l/*, correspond to four distinct phonemes, */r, l, z, š/*, in the rest of Turkic; in trying to reconstruct a proto language, how does one account for this? Were there four or two phonemes originally? What were the feature contents of these phonemes? Were they the

same as the modern Turkic phonemes, or were they something else? To account for the modern four : two ratio, historical linguists usually assume that at one point the ratio was equal, that is four : four. The two missing sounds in Chuvash are assumed to also be liquids and the set is represented as: r^1, r^2, l^1, l^2 . Whether or not each of the sounds in question were phonemes in their own right or whether all four were allophones of a pair of phonemes is the subject of debate, which I will return to in section 4.2.

If the Turkic phonemes /r, l, z, š/ are primary, as the anti-Altaicists believe, then the missing Chuvash phonemes which corresponded to the modern Turkic z and š, must have undergone, at some point in the language's history, rhotacism, i.e. $z > r$, and lambdacism, i.e. $š > l$. On the other hand, if the Chuvash phonemes (and/or allophones) are primary, as the Altaicists believe, then modern Turkic z and š, are the results of zetacism, i.e. $r^2 > z$, and sigmatism, i.e. $l^2 > š$, respectively.

3.2 Both zetacism and rhotacism are common phonological events, and therefore are equally likely to have occurred in Turkic. Their commonness is evidenced in several languages outside of the Altaic family. Zetacism apparently has occurred in the development of Czech ř, and of Polish rz (Poppe 1975), as well as in sixteenth-century French (Sčerbak 1992/93:324). There we find Lat. *cathedra* > Fr. *chaire* > *chaise*, and in the language of the courtisans, no longer preserved, are examples like *père* > *pèze* 'father' and *Paris* > *Pazis*.

Likewise examples of rhotacism can be found within fourth-century BC Latin intervocally:

- (5) *pecus* ~ *pecoris*, (< *pecosis*)
honus ~ *honoris* (< *honosis* > (*honor*) (Róna-Tas 1986)

As well as historically in Germanic:

- (6) Goth. *maiza* > OHGer. *mêra* > Ger. *mehr* = Eng. *more* (Sčerbak 1992/93:324)

Rhotacism has also been seen in Uralic languages, in Samojedic, for example, as well as in Dravidian (Menges 1968).

Sigmatism and lambdacism on the other hand, appear to be quite uncommon. In fact, nowhere in the literature available to me, did anyone cite any examples of either phenomena occurring in any other language. Indeed, one of the greatest complaints of those who criticize the methodology used to investigate zetacism/sigmatism, rhotacism/lambdacism in Turkic so far (Nauta 1972:3), is that the alternation of $r \sim z$, and

l ~ *š*, are usually lumped together as one and the same thing. It is assumed, presumably based on the fact that the alternations occur in the same environment, that whatever motivated either zetacism or rhotacism, must also necessarily have motivated sigmatism or lambdacism. The fact that neither sigmatism nor its alternative, lambdacism, are known in the world's languages so far, in contrast to both zetacism and rhotacism which are well-documented, should be the first indication that there are two quite distinct phonological events to be dealt with. Such distinct events should probably be researched independently of each other until better evidence can be given that points to a common relationship.

3.3 The universal regularity of both zetacism and rhotacism, together with the irregularity of both sigmatism and lambdacism, will clearly not help solve the question of which sounds came first. But an attempt to date when the change took place might at least make a step in the right direction. This can be done by examining loan-words between languages. When faced with written evidence of borrowings either from Turkic or into Turkic, however, it is not always so easy to judge when words were borrowed or in what state they were borrowed in. For example (Menges 1968), in the North-Samojedic language of Jurak, (Samojedic being a part of the Uralic family, considered presently to be separate from Altaic) which apparently has not had contact with Turkic for a long time, if ever, we find *ju* '10', *jur* '100', which are equivalent to Turkic *jüz* < **jüz* '100'. This same cognate is found in Nanasan (Tavgy) *jir* and Eñče (Jenisej) *jü*, languages which are equally far removed from Turkic. If these languages had contact with the pre-Turkic language, and borrowed this word, which exhibits *r*, from it, then we have evidence of *r* preceding *z*. But the interpretation is not necessarily so simple. While these languages may not have had discernible contact with Turkic speakers ever, the possibility of a short-lived, unrecorded contact between merchants or traders should not be overlooked. There is also the possibility of a North-Samojedic contact with Chuvash, or Mongolian, or Manchu-Tungus, which also have *r*, along the silk-road, depending on when the borrowing took place. Thus, on the other hand, the example may have nothing to say about the primacy of *r*. It is interesting to find, however, the same Turkic word in a few South-Samojedic languages, for example Kamaš *ʔ üs* from Abaqan-Tk. *ʔ üs* < *jüz*. While this could be assessed, in contrast to the North-Samojedic examples, as a later borrowing, one that occurred after the sound change, there are still problems. The *r* in the North-Samojedic forms could also be due to an inner-Samojedic development and/or the absence of *z* in the same languages. Can it be proven beyond a doubt that the words in the South-Samojedic languages, exhibiting *s*, were borrowed in recent times, or is it also a possibility that they were more ancient borrowings? This same word '100' also has parallels in Dravidian:

(7) Tamil *nūru*, Malajālam, Konda *nūru* '100', Tulu *nūdu*, Gondi *nūr*, Telugu *nūru*

Menges notes, "this relationship might presuppose a pre-Turkic, possibly Proto- Altaic **nūrū*/**nūr*, ie. it would indicate an ancient **r*..." Likewise, however, the assessment could easily be that the Dravidian cognates are also late borrowings. Clearly, examining evidence of loan-words can be as problematic as relying on the universal frequency of sound change.

Another interesting example of an ancient borrowing in Menges, where the *l* ~ *š* alternation can be seen, is in the Altaic word for 'donkey', likely borrowed from Armenian *ēš*, which, apparently like all IE cognates, can be traced back to an ancient Anatolian form and finally to Sumerian *ašū*. The following are the cognates in Altaic, where as expected, Mongolian and Manchu-Tungus *l* alternates with Turkic *š*:

(8) Mo. *äldžigän* < * *äldžikän* = Ma. *ejxen* < **e'l'ken* < **eldžiken*

(Poppe's reconstruction)

=Tk. *Kāš. äšäk, äškäk* ("and *äšjäk*

which might well be from an older * *äšdäk*, closer to Mo.")

The ancient origin of the loan-word, which itself has *š*, might demonstrate a similar antiquity for *š* in Altaic. But again the same difficulty of interpretation arises. The word could well have been borrowed after the sound change, where the *š* might have been substituted for the more appropriate *l* in the other Altaic languages, because as Menges points out, in Mongolian and Tungus " *š* exists...only as an alternate of *s* in palatal position," but not as a phoneme.

4.0 Altaicists

4.1 The Altaicist position on the sounds in question, that is that the Chuvash reflexes are primary, arises naturally from their approach. In comparing the modern phonemes of cognates between Chuvash and the rest of Turkic, as well as with Mongolian and Manchu-Tungus, it appears that Turkic is the odd man out.

TURKIC	CHUVASH	MONGOLIAN	MANCHU-TUNGUS
<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>
<i>z</i>	<i>r</i>	<i>r</i>	<i>r</i>
<i>l</i>	<i>l</i>	<i>l</i>	<i>l</i>
<i>š</i>	<i>l</i>	<i>l</i>	<i>l</i>

table 2. The Phonemes Compared Across Altaic

From the above table, it is not difficult to understand how the Altaicists came to see Turkic as the language in which the innovation occurred, and the other language families as preserving the ancient forms. The following are examples of cognates across the Altaic languages which exhibit the $r \sim z$, $l \sim \dot{s}$ alternations (Menges 1968):

$r \sim z$:

- (9) Mo. *araya* 'canine, tooth, tusk' = Tk. Käs., etc. *azlyr* 'id.'
=Ma. *aryan* 'tooth'
- (10) Mo. *araj* 'hardly', MMo. *aran* 'id.' = Tg. Ew. *ara-kū-kān* 'a little bit'
=Tk. * *āz* 'little, few'
- (11) Mo. *iraya* 'traces (also on water), furrow' = Chuv. *jěran* 'furrow', **Iran*, *jěr*
'traces, strip'
=Ma. *irun* 'furrow, bed of flowers'
=Kor. *iray* 'furrow; borderline', also
=Tk. **y:z*, **z* 'traces, vestiges'

$l \sim \dot{s}$:

- (12) Mo. *dakda* 'clandestinely' = Ma. *dali-* 'to cover the view, hide, conceal',
Ev. *dal-* 'to cover'
=AT *jašur-* 'to conceal', Ca. *jaš-un-* 'to hide out (intr.)'
- (13) MMo., Mo. *nitbusun* < **ñatbusun* 'tear' = Chuv. *śul* 'id.'
=AT *jaš*, Tkm. *jāš*
- (14) Mo. *gāige* 'whelp' = Old-Bulgarian **kōlāk* < Hung. *kōlōk* 'id.'
= Tk. Osm. *kōšāk* 'young animal, young of a camel'

In addition to these cross-Altaic correspondences, Tekin (1986:142), a firm supporter of the Altaic hypothesis, gives several good reasons for why he believes r and l must have been the phonemes of pre-Turkic:

1. Trk. z = Mo. r , Chu. r

Because to assume the opposite, that is that rhotacism was the phonological change that took place, and that z is primary, means that rhotacism had to occur in the same environments, within a certain time period, in languages as diverse, and as geographically separated as Chuvash and Mongolian.

2. Trk. *š* = Mo. *l*, Chu. *l*

Likewise, to assume that lambdacism took place, and that *š* came first, means that lambdacism also had to occur over a vast territory, between quickly diverging languages. Tekin is here, like so many others, lumping the *r*~*z* alternation with the *l*~*š* alternation.

3. Old Bulgarian words borrowed into Hungarian, presumably before the phonological change, have *r/l*, not *z/š*, as in example 15, pointing to the former pair as primary.

(15) Hungarian *ňār* < Hunno-Bulgarian **ňār* = common Tk. **jāz* 'spring, summer'

4. As well, Samoyed, a Uralic language, has pre-Turkic loan-words which also have *r/l*, and not *z/š*, again pointing to *r* and *l* as primary [see section 2.3].

5. Proto-Bulgarian inscriptions, which contain particularly steadfast names and titles, and Byzantine sources, also have *r*, and not *z*, as in the following example:

(16) Proto-Bulg. Inscriptions probably < **qolobor*, **qolobur* = Tk. *Kāš*.
qolabuz, **qolavuz* 'leader'⁴

6. Most interestingly, there are morphologically related doublets in Turkic, as in the following examples, where one word in the pair has *z* in final position, but the other word in the pair has *r* medially, preceded or followed by another consonant. This latter environment, Tekin says, protected the *r* in its medial position from the zeticism which he assumes to have taken place, as evidenced by the *z* in final position:

eg. *kōkūz* ~ *kōkrāk*
omuz ~ *omraw*
qapīz ~ *qapīrčaḡ*
tiz ~ *tirsgāk*
yawīz ~ *yawrī-*

Interestingly, the type of protector-consonant seems to have no bearing, that is, *r* appears with voiceless stops, nasals, affricates, sonorants, and glides (semi-vowels). Tekin's observation leads him to believe that zeticism was isolated to final position, but there are some difficulties in that conclusion which I will return to in section 4.3.

⁴Examples (15) and (16) are taken from Menges 1968.

4.2 Within the Altaic camp itself there is a division in opinion. They are agreed that *r* and *l* were the pre-Turkic sounds, but they are not agreed on how those sounds should be structurally represented. One side, which includes Ramstedt and Poppe, believe that there were only two phonemes, just as there are only two phonemes in Chuvash, Mongolian, and Manchu-Tungus today. Each of these two phonemes /*r*, /*l*/ had two allophones each, [r¹], [r²], [l¹], [l²], where one allophone appeared in one environment, and the other in a different environment. Because linguists are dealing with unrecorded language at this point, no one as yet has determined what the feature content of these allophones was, nor what environment they occurred in.

Thus far, one theory of conditioning environments was presented by Pritsak in 1964. He explained that *r* and *l* must have collided with a mystery morpheme, *X*, and the collided sounds eventually produced *z* and *š*, respectively. He suggests that the mystery morpheme may have been something palatal like *-ti*. Structurally, the collision looks like this:

$$\begin{array}{ccc} /r/ & & /l/ \\ \wedge & & \wedge \\ [r^1][r^2 + X] >/z/ & & [l^1][l^2 + X] >/š/ \end{array}$$

figure 1. Conditioning Environment for *r*² and *l*²

This accounts for the four phonemes of modern Turkic, with the exception of Chuvash, which like its Altaic sisters avoided the morpheme collision, somehow, and presumably the allophonic variation [r¹, r², l¹, l²] merged with the respective phonemes /*r* /*l*/. Cases of allophones becoming phonemes via loss of conditioning environment, or in this instance, collision with conditioning environment, are amply attested for. The representation of the zetacismic and sigmatismic change in this manner accounts structurally for the change, but the nature of the phonemes, as well as the mystery morpheme with which they "collided" are still vague.

Poppe defends Pritsak's theory and supports the idea of palatal *r*² and *l*² and with evidence from Old Volga Bulgar loan-words in Hungarian (Poppe 1975). The loan-words have sometimes a *y* or *j* after *r* and *l*, or *cs* (=č) after the *l*:

- (17) Hung. *borjú* 'calf' = Turk. *buzay*
 = Mo. *birayū*, Kh. *biarū*, Kalm. *bürü*-, Bur. *burū*

- (18) Hung. *kölyök* 'young dog, young animal in general'
 =Turk. *kösäk* 'young camel, young animal in general'
 =Mo. *gölige* 'young dog'
- (19) Hung. *bölcső* 'cradle' = Turk. *bēşik*, Yak. *bisik* < **bel-čik* 'cradle',
 Yak. *biliä-* < **belä-* 'to cradle'
- (20) Hung. *gyümölcs* 'fruit' = Turk. *yemiş* < **yemilč*

Poppe writes, "these examples demonstrate that Trk. **z* sometimes goes back to **rj*, and Trk. *š* goes back to **lj* and **lč*. Therefore, it is unnecessary to reconstruct **rli* > *z* and **liti* > *š* as Pritsak does." Ramstedt's opinion falls in close with Poppe's conclusion, because he proposed that the *r* and *l* in question were palatalized, ie. Ramstedt's **r'* is similar to Poppe's **rj*, as Ramstedt's **l* is similar to Poppe's **lj*. This evidence certainly makes a good case for Pritsak's mystery morpheme

Menges, however, in positing a distinct polarity in Turkic between palatalized words and velarized words, argues that there was "no reason for the rise or development of any palatalization" on these sounds, because they (presumably *r*² and *l*³) also occurred in velar words. But he also admits that this is a weak argument, because Ancient Turkic (AT) *n'* (palatal n), albeit infrequently, also occurred in velar words, as in the following cognates for 'sheep':

- (21) Orx. *qoñ* 'sheep' = Mo. *xoni* < **qonyn*
 = Common-Tk. *qoj*, Osm., Qrm. *qojun*, AT *anıy* 'bad'

Menges also mentions that in West-Slavic there is much evidence of palatal *r*, ie. *r'* developing into a alveo-palatal fricative *r*, ie. *r'* and even eventually to *ž*. Neither *r'* nor *ž* became simply *z* in Slavic, though.

Hamp (1971) attempted to examine this sound change via feature specification. He writes, "...we may...strengthen the argument for genetic relation by showing a continuity in the nature of specific features." He first reiterates that Ramstedt's *r*² and *l*³ were palatalized, while Poppe's were fricatives⁵, ie. *r*² = [r̥], and *l*³ = [λ]⁶. This statement

⁵Unfortunately the work of Poppe's which gives these fricativized allophones, as opposed to the palatal ones I attribute to him above, is not cited by Hamp.

⁶Hamp initially labels this sound as a "voiceless spirant", which must, hopefully, be a typo, as he later describes the devoicing and strengthening of this same sound, not to mention that the symbol is defined as a

is later important because Hamp decides that the true nature of these sounds was a combination of Ramstedt's and Poppe's conclusions. He draws the conclusion "that the Altaic laterals were more blade- or palatal-articulated and that the *r*-sounds were rather apical," from this formulation: $l^2 > \check{s}$ [-anterior]; $r^2 > z$ [+anterior].

He claims that Altaic r^2 and l^2 must have shared a feature, an assertion of nothing new since both Ramstedt and Poppe assume that the sounds share features like palatalization and fricativization respectively, but he believes that this feature was [+high]. Hamp derives this feature from the observance that r^2 and l^2 appear to raise the vowel *i*, when it directly precedes them and is itself preceded by a [+coronal]. For example,

(22) Mo. *čilagun* = Chuv. *čul*
 = Saxa *tās*⁷

(23) Mo. *širugai* = Chuv. *šur*
 = Chag. *saz*⁸

With that in mind, he then figures that "the most reasonable phonetic values for * l^2 and * r^2 " be [λ] and [ř]."

This interesting hypothesis is ultimately undermined by the inability to tie the features into the phonological changes that occurred. Hamp estimates that [ř] "plausibly" would become [ž], which would "subsequently los[e] its palatality as [z]". He goes on to speculate that "if [λ] developed a more fortis articulation, both devoicing and a marked palatal spirancy could naturally ensue; with loss of laterality this fortis [λ] easily becomes non-apical [š]". This proposed sound change appears no easier than deciding whether *r* or *z* came first. And consequently puts us no further ahead.

A sound change which is much easier to envision comes from Räsänen (in Poppe 1975). He asserts that the l^2 was "an unvoiced spirantic lateral † like that of Ugro-Ostjak which goes back, according to Toivonen, to a Proto-Uralic **l* (= l^2 , or *l* in palatal position)." This unvoiced lateral sound is much like š. It is easy to imagine that children in the process of language acquisition, would make the change from voiceless lateral, a

"voiced alveolar laterally released affricate" in the Phonetic Symbol Guide, G. K. Pullum and W. A. Ladusaw, University of Chicago Press, 1986, pg. 94.

⁷No glosses are provided.

⁸While he claims an assimilation in height for the other Altaic languages, he claims a dissimilation in height for Turkic, i.e. *ı* > a.

more complex sound on the basis of its rarity in world languages, to *š*, a simpler sound based on its commonality in world languages. Such a change would be utterly independent of zetacism or rhotacism.

4.3 At the beginning of section 4.2, I stated that there was a division amongst the Altaicists as to the structural representation of *r*² and *l*², where one side views them as allophones. The other side, which I will return to now, believes that *r*² and *l*² were phonemes in their own right. This point of view, held by Miller and Tekin, appears to be somewhat confused. Tekin (1979:123) writes, "I believe that *r*² and *l*² became *z* and *š* respectively in Proto-Turkic in final position, but in other positions they converged with *r*¹ and *l*¹..." While Tekin is isolating zetacism and sigmatism to a particular environment, which one expects of an allophonic change, he claims that *r*² and *l*² were not restricted to this environment. Tekin argued at first that the change occurred only in final position, but his reasons for claiming that *r*² and *l*² were phonemes in their own right, rather than allophones, remained unsaid. Above, at the end of section 3.1, examples of Tekin's morphological doublets, such as *köküz* : *kökräk* were given. These examples initially appear to well support a change isolated to final position, but it has been pointed out (Doerfer:1984) that there are also many examples of *z/š* in medial position as well. For example,

(24) Tk. *qozī* = Mo. *qurağan* 'lamb'

(25) Tk. *qašūq* = Mo. *qalbağā* 'spoon'.

Tekin has attempted to explain these by breaking them down into monosyllabic words, where the sounds in question are again final as with:

(26) *īši* / *eši* 'lady' could be > **eš* 'partner, companion, consort' + 3rd pers. poss. suffix or it could be a loan-word of unknown origin (because it is an ancient title)

(27) *ešū-* / *āsū-* 'to cover, envelop' could be > **āš* + *-ū-* the Turkic form of the Altaic causative-passive suffix **-bu-* / *-bü-*

He has not been able to do this with all di- and trisyllabic words, however.

Miller (1971), another believer in the four liquid phoneme hypothesis, claims, as I alluded to above, that Tekin's attempts to isolate the change to final position creates a "serious methodological problem," because it "obscures...the single most important element of fact that has been established about the proto-Altaic sound system...i.e., that

the proto-Altaic linguistic unity was distinguished by a four-way contrast in both the lateral and the non-lateral liquids, with two different contrasting varieties of each, *r¹, *r², *l¹, *l²." In other words, by isolating the change to a single environment, Tekin is postulating a single phoneme for r, as well as one for l, which throws the four-way contrast out. Miller goes on to argue that strict definitions are needed of what "medial" and "final" positions are in Altaic. Such definitions may help save Tekin's theory. But by his 1986 article, without much ado, Tekin had changed his mind anyway, and began positing the change both finally and medially. He writes that "since *r² and *l² were phonemes in proto-Altaic and pre-Turkic" then they probably occurred both word-finally, and word-medially, which is an adjustment exactly along the lines of what Miller said. Tekin has codified his new position as:

1. PA *r², *l² > PT *z, *š intervocally and word-finally; otherwise, i.e. before and after a consonant, *r², *l² escaped zeticism/sigmaticism and merged with *r¹, *l¹ respectively.
2. PA *r² and *l² simply merged with *r¹ and *l¹ in each proto-Chuvash, proto-Mongolian, and proto-Tungus.

In the end, it is of less consequence to establish a structural notation, than it is to discover the possible phonetic nature, feature content, and conditioning environments of these sounds. The former should naturally reveal itself from the latter.

5.0 Anti-Altaicists

5.1 That the anti-Altaicists believe the modern Turkic phonemes were primary follows from the fact that they do not consider the other "Altaic" languages when looking at the contrast between Chuvash and the rest of Turkic. For them the debate is schemed as this:

All the Turkic languages: Azerbaijani, Kazakh, Turkish proper, Uzbek, etc.	r z l š	Chuvash: r l
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table 3. Phonemes of Turkic Compared

When looked at from this perspective, it appears as though Chuvash is the language with the innovation. Any Mongolian or Manchu-Tungus cognates which appear to be similar are inconsequential, because they must be loan-words of Chuvash. The next logical step for the historical linguist is to try and formulate how this change in Chuvash came about,

but it does not appear as though anyone has even made an attempt. Unfortunately for this point of view, their label is indicative of their direction of argumentation. All the energy of the anti-Altaicist is poured into trying to prove why the Altaic hypothesis cannot be true, rather than building a solid foundation of arguments which support their own view of the primacy of Turkic x and ξ . Miller (1989) correctly psychoanalyzes their approach as a fear that their side is mistaken, and thus their only defense is in attack.

5.2 Fortunately for the Altaicists, a devil's advocate is an excellent tool for flushing a theory out, and arguments used by the anti-Altaicists have in many ways helped the Altaicists pad their own arguments, as well as direct their research. One argument used by anti-Altaicists is that the lexical similarity between the proposed genetic relations is restricted to only a negligible percentage, or at least a percentage unacceptable for related languages. Sir Gerard Clauson relates (1962 in Miller 1989),

As a young man I had always accepted the theory that the Turkish and Mongolian languages were genetically related...so when a Romanized text of the Secret History of the Mongols ...became available, I tried to read it. I did not begin to understand it...And so I came to the conclusion that the theory that the Turkish and Mongolian languages were genetically related --the Altaic theory--was almost certainly wrong..."

What immediately springs to mind is an analogy with IE. Clauson's hubristic statement insinuates that if languages are related they ought to be mutually intelligible, and thus a native speaker of English ought to be able to read Greek, or Russian, or Celtic, and vice versa, because they are genetically related. In fact, the number of surviving IE lexical items common to the modern IE languages is quite minimal. But unlike Altaic, IE has a rich, long, and impressive number of ancient sources upon which to build its case.

Another argument used by the anti-Altaicists, which goes hand in hand with lexical correspondence, is the great variation amongst the supposedly related languages with the "stable word stock." The stock includes numerals, fishing and hunting terms, wild animal names, natural phenomena, basic social concepts, and parts of the body (Róna-Tas 1986). The argument is that if these languages were related, they would have much common everyday terminology, used often and therefore most likely to preserve the oldest forms, in common, but they do not. Interestingly, IE seems to have the same problem. If we compare the word for 'moon' in both Altaic and IE, we end up with similar results:

Altaic:

Mo. *sara*

Tu. *ḡy*

Ma. Tung. **biyaḡa*

Indo-European:

Rus. *luna*

New Gr. *φεγγαρι*

Ir. *gealach*

Ger. *Mond*

Sanskrit *candra*

table 4. Cognates of "Stable Word Stock" in Altaic and IE Compared

Although 'moon' in IE has some correspondences (Romance and Russian), there is apparently "no single original IE lexeme" reconstructable for 'hand' in IE. (C. D. Buck identifies at least six traces of it, in Miller 1989) A fact which is likely true of several other stable word stock items, to be contrasted with the few words which *can* be reconstructed within the same stock. The unpredictability of surviving forms is as true for Altaic as it is for IE. The word for 'hand' in Altaic is easily reconstructed below, but the anti-Altaicists are quick to point out that many other names for body-parts are not relatable.

- (30) Mo. *gar* 'hand, arm, side, flank, wing of an army',
 =Ma. *gala* 'id'
 =Go, Olc., Oro., *ḡala*, Sol. *nāla*, Negd., *ḡāla*, Ev. *ḡāle*, Lam. *ḡāl* 'id'
 =Mtrk, Chag, Alt, Kum. *qarī* 'upperarm', Osm, Tat, Alt, *qarīs*
 'span', NTrk. *karīs*
 -NJ *kara* < **gara* 'handle', NKor. *-kalak* 'a spindle, long slender
 stick; a digit', MKor. *kalak* 'a finger'

Poppe (1972) provides several other examples of correspondences of body part terminology, included in the stable word stock, across the Altaic languages, of which I will only include three here:

- (31) Mo. *örö* < **öre* 'interior, heart, abdomen, coronary artery, pit of the
 stomach precordia
 =Ev., Lam. *ur* 'stomach', Lam. *uremde* 'middle, center, abdomen, interior'
 =Turkm. *öz* < **ö:r²* 'self', Yak. *üös* < **ö:r²* 'marrow, middle';
- (32) Mo. *erekei*, MMo. *herekei*, PMo. **perekei* 'thumb'
 =Ma. *ferxe*, Goldi *puru*, Lam. *heregen*⁹ 'id'
 =AT *erḡäk* 'finger';

⁹ Please note: *g* = schwa here and elsewhere in the paper.

- (33) Mo. *qoŋco* 'fleshy part of the thigh', *qoŋdolai* < *qoŋdalai* 'thigh', SH *qonŋ iyasum* < **qoŋdŋgāsun* 'anal region', Buriat *xonzōhoŋ* 'posterior'
 =Ma. *qonsun* 'anus', Ev. *kundukŋsakrum*
 =Ko. *kuŋduŋi* 'posterior'
 =AT *qoŋ* 'muscles, fleshy parts';

Hetzenberg (in Poppe 1972), whose paper pointed out ways in which IE studies could aid Altaic studies, makes an interesting remark about the lack of common numeral terms. He says "that [this] only proves that the typological structure of the Altaic proto-ethnic stage was different from that of the IE, and that the system of numerals did not exist as it does not exist in some languages spoken at the present time." This reminds us that each language is different, not only in how it expresses ideas, but also in the ideas it expresses. We must be careful not to criticize what we expect to see because of our own frames of reference.

Another useful suggestion comes from Cincius (in Poppe 1972) who insists "that investigation of a given word should include a thorough study of the whole word family. Only such a method will enable the investigator to trace the root in question back to a protoform in the common language." Following this idea (which makes the utmost sense, given the innovativeness of language), Poppe provides this etymology for Turkic 'leaf':

- (34) Is Mo. *nabči* < **nap-tī* related to Turk. *yap-raq* 'leaf'?

Mo. *nabtayi-* < **nap-ta-gī-* 'to become low, to bend down', *nab-ta-r* 'low', *nab-qa-yi-* 'to lower, to become low', *nab-či-gar* 'flattened, flat', *nab-ta-r-da-* 'to become low', *namaŋa* 'foliage', Kh. *nam^a* < **nap-a-gā* 'foliage', *nam* < **nap* 'low'
 =Ev. *napta* < *nap-ta* 'lowland', *nap-ta-* 'to spread out', *nap-ta-gā* 'lowland', *nap-ta-kān* 'flat, smooth, even, low' (of land), *nap-ta-ksa* 'lowland', *nap-ta-lā-* 'to lie widely spread out', *nap-ta-ma* 'flat, low', Lam. *namtihak* < **nap-ti-sa-k* 'low'
 =Turk. AT *yap-ī-r-ŋaq/yap-u-r-ŋaq* 'leaf, bud' from *yap-u-r-* 'to make smooth, to make even', New Uighur(NU) *yap-ī-l-aq* 'flat', cf. Alt(ai), Tel(engit), Le(bed), Küar(ik) *yabīs* 'short (of stature), low', etc.

Clearly the root **nap* had the general meaning of something flat (>low) and hence 'leaf' (<something flat). Even within Turkic, the meanings vary:

- (34) a. AT *yalpīryaq* 'leaf'
 = Chag. *yalpaq* 'flat, even'
 = Alt., Tel., Leb., Kiiar. *yalbaq* 'flat, wide'
 -compare with Mo. *dalbayi-* 'to be wide, to be flat'.

Also the etymology for the colour yellow (in Poppe 1972) lends strong support to the need for a broader search when looking for correspondences:

- (35) Mo. *sira* < **siāra* 'yellow'
 =Chuv. *šura* < **siāra* 'white'
 =Turk. *sarī* < **siārīy*, AT *sarī* 'yellow'
 =Ev. *siġgama* < **sirgama* 'yellow, brown', Lam. *hiġgan'ā* 'yellow'
 a. could possibly be connected etymologically with:
 Mo. *siruya*, MMo. *siru'ai* < **sirugāi* < **siār-u-gāi* 'earth, dust'
 =Ev. *sirugī* < **sirugai* 'sand, sandbank in river'
 b. also to be compared with:
 Chuv. *šur* < **siār* 'swamp'
 =Turk. *sāz* < *saz* < **siār*²

The study of word families shows similar results for IE. Syromiatnikov (in Poppe 1972) names the 'word family' *language units* but the concept is identical. For example, Russ. *glaz* and Ukrainian *oko* both 'eye' are not related, but Russ. *ok-no* 'window', *oč-ki* 'spectacles', on the other hand do share their root with *oko*.

Of course, the main argument that the anti-Altaicists use to disprove the genetic affinity of similar word correspondences, is that the words are borrowed. Servortian (in Poppe 1972) has concluded "that 10% of all Manchu-Tungus stems have correspondences in Turkic." In a similar vein (Róna-Tas 1986), modern Hungarian has an estimated 300 pre-conquest Turkic loan-words (Bulgaro-Turkic in other words) of which it seems, that more than 100, or "1 in every 3, have a perfect Mongolian parallel." Many of those parallels have what Róna-Tas calls the 'Chuvash criterion', that is where Chuvash has *r* and *l*, common Turkic has *z* and *š*, a point which of interest to us, but which Róna-Tas does not dwell on. The anti-Altaicists have a strong argument for borrowing, in that contact between Turkic languages, Mongolian, and Manchu-Tungus was extensive for reasons of trade. Ligeti (1958 in Róna-Tas 1986) states the argument for the anti-Altaicists well:

...the Turkic and Mongolian languages have been -as testified by historical sources, mainly Chinese- in permanent contact with each other for nearly 2000 years...It cannot be doubted that as a result of these contacts we have to reckon with intercrossings and borrowings from various ages and of varying intensity...it may often be the case that a correspondence, thought to derive from the Altaic parent language is in fact nothing but the trace of a contact that took place after the separation of the two languages. The danger of misunderstanding is especially great if the correspondence due to this interaction comes from an age prior to the oldest extant textual documents of the Turkic or Mongolian language.

One might, with sufficient historical and archaeological evidence, make a case for a *lingua franca* which in turn could have influenced the native tongues of its speakers. Such a common business language, depending on how well developed it became, could help explain similarities between Turkic, Mongolian and Manchu-Tungus which extend beyond the lexicon. But this would be a difficult case to make. On the other hand, it seems to be a more plausible explanation than the sweeping borrowings that are supposed to have taken place across the vast geography of languages. The type of contact that the languages had is measurable in the corresponding semantic groups. Terminology for stockbreeding, military organization, literacy, and metallurgy, for example, form parallels between Mongolian and Turkic. Words like 'copper', 'bronze', 'iron', 'tin', 'lead', 'to found', and 'mine', depending on when the common-Altaic language is dated to, point to later borrowings, rather than survivors of Altaic, simply because the words imply a more advanced metallurgy than existed in pre-historic times. And as Róna-Tas writes, "all that is shown by a thorough analysis of the material is that the linguistic relationship between the Turkic and Mongolian peoples is relatively very remote, and the majority of the agreements are relatively late loans, a process possible between related languages."

Interestingly, according to Miller (1989), morphological and syntactic evidence, which point to the common relationship of Altaic remains untouched by the anti-Altaicists. Their main bone of contention is the $*l^2$, $*r^2$, and otherwise, Miller (1989) contends, they have also largely left Ramstedt and Poppe's reconstruction of the proto-Altaic sound-system alone. But other than $*l^2$ and $*r^2$, the phonological system of a non-existent language as far as they are concerned would not be worth debating. That they ignore morphology and syntax is noteworthy, however. Miller explains that,

Long before the details of Altaic comparative phonology...were understood, the existence of the earlier linguistic unity had been securely postulated by G. Ramstedt...on the basis of vestiges of its original system of secondary deverbal stem formation that Ramstedt was able to demonstrate as having survived in the morphology of the later corpus languages...its essential point was and remains sound: only an earlier proto-language could explain the latter attested morphology.

Nominalization of verbs, or deverbal nouns, is one of the most characteristic attributes of the Altaic languages, found not only in Mongolian and Manchu-Tungus, but also irrefutably in Turkic¹⁰. Not only is the common existence of deverbal nouns significant, but also the fact that they are syntactically employed in strikingly similar ways, and that their morphological components are easily paralleled. Miller claims that there are numerous examples of other such "highly specific structures...crossing back-and-forth between the morphological and syntactic levels." If this is true, the anti-Altaicists would have a difficult time proving that these integral linguistic units, rarely borrowed because of their context dependent functions, were borrowed systematically across such a wide selection of languages.

5.3 What does all of this have to do with rhotacism and lambdacism? Nothing really, but it has a lot to do with zetacism and sigmatism, in that all of the above are methods which the anti-Altaicists use to prove that the latter sound changes are inconsequential to the reconstruction of proto-Turkic. Within the anti-Altaicist camp, there are also divisions. Róna-Tas, for example, is not an anti-Altaicist in the strict definition of the word. Although he is certain that Turkic *z* and *ʃ* are primary, he does not deny that an Altaic unity could have existed at a distant, irretrievable point in the past. If it is assumed that the sound change was also the initial break into Turkic dialects, which later became separate languages, then the sound change occurred before there were any written documents. Consequently, to assume that an Altaic language existed beyond that point is unprovable to Róna-Tas. Presumably he has similar difficulties with other proto-languages, which are usually created in the absence of written documents.

Most agree that the common-Altaic period existed well before the first millennium AD, as is true of IE. The approximate dating of the sound change, which Róna-Tas assumes initiated the greater divergence of common-Altaic dialects into developing languages, is best evidenced by the word for 'stirrup'. This word is diagnostic because the Turks (and/or the Mongols) are accredited with the invention and quick development of this important technological change. Rhotacism, or zetacism, can be seen in the cognate for the Turkic languages:

- (36) proto-Chuv. *yārana* > **irāṇā*
 = Stan. Trk. **ūzeṅgü* (for Oghuz, Kipchak, Turkestan)
 and **izeṅge* (for Baraba, Khakas, Turanian, Yakut, Yellow Uighur)

¹⁰ See Menges 1996.

While the appearance of the stirrup has been dated anywhere from the sixth to the third century BC, Róna-Tas claims that at the very least the phonological change must have taken place in the last few centuries before Christ.

Not all anti-Altaicists are even agreed that *z* and *š* were the primary sounds of proto-Turkic. Doerfer, who for many years supported their primacy, began to support instead the primacy of *r*¹¹, and accordingly has adjusted his reconstructions. But he adamantly argues that the primacy of one sound over another has nothing to do with the Altaic hypothesis. He asserts that his change of opinion, that is the primacy of *r*, was prompted by "internal reasons of the *Turkish* phoneme structure," (Doerfer, 1984:37). What those internal reasons were, Doerfer does not specify, though he does direct the reader's attention to another article, where presumably those internal reasons can be found.¹² Specifically, he reconstructs the *r* as **ri*, which is closely related to a palatal *r*, or *ř*. Like Tekin and Miller, he believes that **ř* is a phoneme in and of itself, to be kept separate from **r'*. Also like Tekin, his reasons for postulating two phonemes eludes the reader.

6.0 Conclusion

While Miller (1989) diplomatically asserts that the anti-Altaicists are winning the debate over whether Turkic belongs in the Altaic family, he is being ironically modest. It appears to me that the arguments for Altaic unity, such as the lexical, morphological, and syntactic correspondences common to Turkic, Mongolian, and Manchu-Tungus languages, as well as the arguments for the primacy of *r*, if not *l*, which are based on those very correspondences, are much stronger, better compiled, and more well thought-out. The weakness of the Altaic argument lies in the lack of a specific environment that could have governed the sound change in question, and a lack of agreement on the phonetic nature of those phonemes.

Acknowledgments

I would like to thank Dr. M. Dobrovolsky many times for all his comments, criticisms, and especially patience provided during the first few drafts.

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¹¹It is not clear whether the primacy of *l* is also supported, as it is not mentioned in this context.

¹²This article, cited in Doerfer, was unavailable to me: TDAY-Belleten 1975/6. 33-37

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Politically (In)correct Limericks

She frowned and called him “Mr.”
Because, in fun, he kr.
And so, in spite
That very night,
This Mr. kr. sr.

A girl who weighed many an oz.
Used language I dare not pronoz.
For a fellow unkind
Pulled her chair out behind,
Just to see, so he said, if she’d boz.

Student Bloopers

A phonetics student who had studied furiously on the way to an exam overlooked a small detail. Blissfully unaware of the physiological impossibility of the answer, the student labelled an IPA symbol as an apico-glottal stop.

A syntax student in the middle of an exam simply could not figure out the problem with an example of an ungrammatical sentence. The student explained that the sentence “The ball throw” had been incorrectly labeled as ungrammatical because “Yoda talks like this”.

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Manuscripts should be produced on a Macintosh computer in the following format using Microsoft Word for text and Superpaint or Macdraw for tables, graphs, etc. Disk format required is 3.5 inch and high density. If this is not possible, please contact the editors regarding alternate arrangements. If the disk is to be returned a self addressed envelope should be sent also.

2.0 Manuscript Conventions

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- 2.2 Each article should begin with the title, name of the author, and institutional affiliation or place of residence, all typed on separate lines with no spacing between these lines. Titles should be short, descriptive, and straightforward.
- 2.3 All footnotes, references, tables, diagrams, maps, etc. should NOT be on separate sheets but should be placed in their appropriate locations.
- 2.4 Section headings are required. Main headings should be bolded and underlined but not all-caps: e.g. **Introduction**. Section sub-headings are optional, but no more than one level of sub-headings should be used. Sub-headings should not be all-caps but should be bolded, e.g. **Sentence Types**. There should be no spaces between section headings and text.
- 2.5 All text should be fully justified including abstracts, text body, footnotes, references, etc

3.0 Text Conventions

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 - Forms cited in phonetic transcription should be enclosed between square brackets.
 - Forms cited in phonemic transcription should be between slant lines.
 - Other cited forms (e.g. underlying forms) should be underlined.
 - Authors may specify other transcriptional devices such as vertical lines, curly brackets, obliques, etc.
- 3.2 Glosses of linguistic forms should be enclosed between single quotation marks, which are not otherwise used: e.g. /amihkw/ 'beaver'. Double quotation marks should be used only for short quotations, reported conversation and the like.
- 3.3 The abstract and extended quotations of more than three typed lines should be set apart from the main text by double spacing both before and after the quotation, should be single spaced, and with both the left and right margins indented five spaces. No quotation marks of any sort should be used.
- 3.4 Sets of examples or example sentences should be numbered serially with Arabic numerals closed in parentheses. If several such examples are grouped together, the entire group is identified by an Arabic numeral, and the individual sentences by lower case letters, e.g.:

- (5) a. John loves Mary.
- b. Mary is loved by John.

Rules set off from the text should be similarly numbered, e.g.:

(3) C --> [-vce]/_____#

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- 4.1 Number figures and tables consecutively (figures separately from tables) with Arabic numerals. All figures and tables should be placed in their respective places within the text.
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...the extended linkage³ which is...

Footnotes at the end of a sentence should follow the final punctuation:

...as evidenced in Gothic.³

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...it has been suggested (Johnson, 1959:32) that...

If the author's name is part of the sentence, only the numbers are between parentheses, e.g.:

...Johnson (1959:32) has suggested that...

If the author's name is part of a parenthetical comment, the parentheses are omitted from the numbers, e.g.:

...some have suggested (including Johnson, 1959:32 and Smith, 1963) that...

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Papers should not include page numbering. Authors are, however, asked to lightly write the page numbers on the back of the pages in pencil

Left, right, top and bottom margins should be not less than 1.5".

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