This paper will address the issue of word order variation in ASL sentences, which has intrigued researchers for over 20 years. I will argue that an information packaging model provides a natural explanation for ASL word order permutations in terms of the identification of information as focus and the prosodic requirement that focus must receive prominence. This argument was essentially made for English in Creider (1979), wherein it is argued that stress and intonation provide the explanation for movement transformations, and that a typology of discourse organizing languages could be developed. There are three parts to this discussion: (1) implications of an information packaging model for surface word order; (2) interaction of a language’s phrasal stress assignment system with information packaging; and (3) distinctions that arise among languages in their treatment of information that is not in focus. I will suggest that a typology can be constructed on the basis of the interaction of two parameters: Vallduvi’s (1991) feature [±plastic] which indicates whether a language allows stress shift, and one that I will call [±GR], which refers to whether a language gives primacy to Grammatical Relations or to Discourse Roles in the determination of surface word order.

Arguments have been offered that ASL is typologically an SVO language, that different word orders reflect both syntactic and pragmatic functions, and that such word order changes are marked prosodically (Aarons et al. 1992; Fischer 1975, 1990; Liddell 1978; Petronio 1991, 1992; Romano 1991; Wilbur 1991, 1994a). The role of morphological marking has also been recognized (Kegl 1976). I will provide an overview of the arguments that lead to the conclusion that even though ASL basic word order is SVO, its surface word order is primarily determined by what information is in focus and the fact that ASL has fixed phrasal stress assignment in final position. Catalan provides a language comparison, in that it also has basic SVO word order and fixed phrasal stress. However, there are significant distinctions between ASL and Catalan in how they accomplish the goal of putting focus in main clause final position: ASL prefers leftward movement (preposing) to remove non-focused material from final position, while Catalan prefers rightward movement (right detachment or dislocation) to accomplish the same task. Also, ASL allows considerably greater freedom of constituent ordering in the main clause, while Catalan preserves as much of its SVO ordering as it can (Vallduvi 1991). Russian provides yet another type of comparison, in that it displays determination of surface word order by discourse relations like ASL but it allows phrasal stress to shift to different positions in the sentence like English (King...
Spanish is a spoken language representative of the category containing ASL, with both the absence of stress shift and the preference for Discourse Role determinants of word order.

1. Information Packaging Perspective

From an information packaging perspective, focus is the central determinant of both surface word order and prosodic structure (Chafe 1976; Lambrecht 1994; Prince 1986; Vallduvi 1992). The presentation of information in a sentence is structured according to the speaker's belief regarding the hearer's knowledge and attentional state (whether something is in the hearer's mind at the time of utterance; variant formulations of this generalization exist, but the distinctions that they are intended to capture are not relevant here; Chafe 1976; Delin 1992). For information packaging purposes, focus is defined as the "information the hearer is instructed to enter into knowledge-store" (Vallduvi 1992). The non-focus information, or ground, indicates to the hearer where and how the focus information should be entered into the knowledge store. Vallduvi argues that ground includes at least two different specifications: link information, which is commonly viewed as topic or theme, indicates where the information should be entered in the hearer's knowledge store, while tail information, if present, may indicate to the hearer to substitute the focus information in place of existing information in the knowledge store. In this framework, then, the absence of a tail would imply that the focus information was additional information, while the presence of a tail would imply that the focus information was replacement information. Typically, the order of information presentation would be link - focus - tail. There appear to be important differences between ASL and Catalan in their treatment of tail information.

2. Interaction of Information Flow, Prosody, and Word Order

2.1. Role of stress placement plasticity

In English, phrasal stress may be shifted to different positions for different focus readings while the syntactic structure remains unchanged. Example (1) illustrates a focused object NP, (2) a focused V, and (3) a focused sentence, which shows also that in English the stress prominence is on the last argument, in this case the subject (capital letters indicate the location of the primary stress):

- English: The boss [hates BROCCOLI]
- Catalan: L'amo [odia el Bròquil]

In Catalan intonational prominence is fixed on clause-final position and syntactic operations must be used to make the focus fall together with prominence. Vallduvi (1991) notes that in Catalan, ground information is "forced out of the core clause". The Catalan focused object NP structure is essentially the same as English (1), as both languages have basic SVO order and the object NP is therefore already in final position for focus in Catalan. The Catalan focused V requires the direct object NP to be moved out of final position in the core clause (indicated by t and a comma), leaving the V in final position for focus (2). The rightward moved object NP is now in its own clause (at least intonationally) and it must remain unstressed. The Catalan focused sentence shows that the argument available for stress, namely the subject (as in the English equivalent), appears in final position for focus and prominence (3).

Vallduvi proposes that the difference between English and Catalan is their setting on the Plasticity Parameter: English is [+plastic] and allows molding of the intonation contour by stress shift to attain togetherness of focus and prominence, while Catalan is [-plastic] and doesn't allow stress shift. As a consequence, Catalan requires that the focus information and the prominence in final position be brought together by other (syntactic) means. I have argued that ASL is also [-plastic], that is, the order of words must be adjusted to put the focus item in a position of prominence rather than adjusting the prosody to make the prominence fall on the focus item (Wilbur 1994a, c, 1995b, 1996). Like Catalan, ASL prefers to have the focused item in final position of the main clause (of course, unstressed clitics may attach to the stressed item; Petronio 1993; Wilbur 1994c). However, differences between the two languages will be a constant thread in the following discussion.

2.2. Effects of fixed stress on ASL word order

In general, the most neutral of stress patterns is the one in which the entire sentence is in focus (broad focus; Bolinger 1985; Cruttenden 1986; Gussenhoven 1983, 1985; Ladd 1980). These are the forms that might occur as a statement following a conversational opener like "Hey, know what?"

(4) TOMORROW GO WORK PRO.1 NOT HAVE-TO, CAN STAY HOME

In other contexts, when the item to receive prominence may not be in final position, at least three strategies are observed in ASL. First, the item may be doubled, so that it appears both in its original slot and in final position (Bos 1995, Petronio 1993, Wilbur 1995a).
(5) FIND-#OUT PRO.I CAN’T STAY HOME CAN’T
   ‘I discovered that I really can’t stay home.’

Second, the item may appear in final position.3 Examples (6) and (7) illustrate
simple cases of modals in final position; (8) shows that such structures can be em­
bedded; and (9) shows that simple negation may also participate in this structure:

(6) BUT STAY HOME ALL-DAY EVERYDAY CAN’T
   ‘but I can’t stay home all day every day.’

(7) MARY BECOME DOCTOR SHOULD
   ‘Mary should become a doctor.’

(8) BILL THINK MARY BECOME DOCTOR SHOULD
   ‘Bill thinks Mary SHOULD become a doctor.’

(9) JOHN WALK P ARK NOT
   ‘John didn’t walk to the park.’

Third, there may be overt syntactic focusing. Example (10) illustrates the wh­
cleft (or pseudocleft), which is extremely common in ASL usage.4

(10) FIND-#OUT WHAT, STAY HOME CAN’T
   ‘What I discovered is/was that I can’t stay home.’

In a series of papers, I have demonstrated that the wh-cleft in ASL meets all
the criteria for a true focus structure and that the common references to it in the
ASL literature as the rhetorical question structure fails to capture its appropriate
structure and function (Wilbur 1994a, 1995b, 1996). In this structure, the first
clause equivalent to the English what I discovered represents non-focused presup­
posed material containing an open proposition (that is, one containing a variable),
and the second clause contains the focus material (which provides the information
for the variable; Prince 1978, 1986).

Another syntactic focusing structure that has been identified for ASL is the
cleft which is marked with THAT, identified by S. Fischer (p.c.) as the equivalent
of the English it-cleft. I will return to this structure later in Section 3.5

3. How ASL Differs from English and Catalan

The lack of stress shift in ASL represents a major distinction between it and Eng­
lish. The result of this difference can be seen in the fact that ASL also lacks exactly
those variants of syntactic structures in which the focus is not in final position. In
English, predicate nominals (11) and wh-clefts (12) have so-called plain and re­
versed forms (Collins 1991a,b; Heggie 1988; Heycock 1991, 1992; Wilbur in
press):

Plain                                          Reversed
(11) My sister is the doctor.                 The doctor is my sister.
(12) Lee’s tie is what I don’t like.          What I don’t like is Lee’s tie.

The plain form of the predicate nominal may be viewed informationally as
link-focus (cf. also theme-rheme) while the reversed form (with stress on doctor) is
focus-ground. The plain form of the wh-cleft is focus-ground and the reversed
form is link-focus. The absence of stress shift in ASL means that the two cases in
which the focus is not in final position, namely the reversed predicate nominal and
the plain wh-cleft, do not occur; only those forms with the focus in final position
are found:

Plain                                          Reversed
(13) MY SISTER DOCTOR *DOCTOR PT MY SISTER
    ‘My sister is the doctor.’                  ‘The doctor is my sister.’
(14) *LEE POSS TIE WHAT PRO.1 PRO I DISLIKE WHAT, LEE POSS
    DISLIKE                                 TIE
    ‘Lee’s tie is what I don’t like’.           ‘What I don’t like is Lee’s tie.’

To illustrate, consider a situation in which people are attending a play in which
one person’s sister has the role of a doctor. In English, the person has both options
in (11), but in ASL, only the plain predicate nominal in (13) One structure that
looks similar to the reversed predicate nominal is the wh-cleft (15), but it is my
sister that is in focus, not the doctor.6

(15) DOCTOR PT WHO, MY SISTER
    ‘The one who is the doctor is my sister.’
In sum, then, the absence of stress shift in ASL results in only two syntactic forms for which English has four: the two forms that do not occur are those in which the focus would not be in final position and hence would not receive prominence. These examples illustrate the interaction between the ability to shift stress, the location of focus, and the surface word order possibilities in English and ASL.

A comparison between ASL and Catalan reveals other differences, ones which are particularly interesting because both languages have basic SVO order, do not allow stress shift, and prefer focus in final position. Vallduvi argues that the basic strategy for achieving focus in final position in Catalan is by multiple right detachment, that is, by moving non-focused material rightward. Note that all possible orderings of tail information can occur:

(16) [AL CALAIX,} ficara el ganivet el Juli. 
In-the-drawer, put-future the knife Juli

[AL CALAIX,} ficara, el ganivet, el Juli. 
[AL CALAIX,} ficara, el Juli, el ganivet. 
[AL CALAIX,} el Juli, ficara, el ganivet. 
[AL CALAIX,} el ganivet, el Juli, ficara. 
[AL CALAIX,} el ganivet, ficara, el Juli. 
‘Juli will put the knife in the DRAWER.’

The actual ordering of tail phrases used is discourse dependent, but these possibilities illustrate another aspect of Catalan, namely that when the non-focused material is moved rightward out of the core clause, the strict SVO word order seen in main clauses is no longer maintained. The first tail serves the function of indicating that the focus information should be substituted for what the speaker believes the hearer has in knowledge store. I will refer to this use of tail information as a mild contrast indicator, in the sense that there are much stronger ways that the speaker could tell the hearer that the information the hearer already has is incorrect. Subsequent tails are presumably redundant for this function. The fact that Catalan allows multiple tails when only one is needed to identify the focus as a substitute indicates that it has a higher tolerance for repetition of discourse-old information.

ASL conversation generally does not use this type of mild indication of contrast. If the intended purpose of the focus information is to contrast strongly with the hearer’s belief as assumed by the speaker, ASL uses formal contrastive structures rather than mild tail indications. If the tail would be merely redundant, it is omitted entirely. This fact became obvious in my attempts to use focus questions to elicit different focused constituents as answers (cf. Kanerva 1990). In English, the sequence “What did the boy throw at the house? The boy threw the ROCK at the house.” is perfectly acceptable; the answer part even has a stereotypic stress and intonation pattern. Indeed, in some contexts, such as classrooms or polite/formal conversation, complete sentences are expected, at least from children. In ASL, the appropriate answer is much more likely to be just ROCK, and efforts to elicit a complete sentence from ASL consultants result in frustration on both sides, or worse, signed English versions of the desired complete sentence. ASL strongly avoids redundancy in conversational turns. If apparently redundant information is present, then a purpose is being served.

Consider first (17) which illustrates a response to an echo question (who?) that requests the proper person (Kay or Kim) be selected as clarification (Selecting Focus; Ferro 1993):

(17) A: Kay and Kim got in a wreck Saturday. I think she wasn’t wearing her glasses or something. 
B: WHO wasn’t wearing her glasses? 

English

<table>
<thead>
<tr>
<th>A</th>
<th>Kay wasn’t wearing her glasses.</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>(a) KAY</td>
</tr>
<tr>
<td></td>
<td>(b) KAY, THAT WHO, THAT</td>
</tr>
<tr>
<td></td>
<td>(c) KAY PT, GLASSES, NOT HAVE</td>
</tr>
</tbody>
</table>

In English, it is normal and acceptable (but not required) to repeat the information wasn’t wearing her glasses as part of the answer to the wh-question. In ASL this information is normally deleted. Trailing information, such as THAT WHO, THAT in (17b), repeats the focus of the echo question WHO wasn’t wearing her glasses?, but none of the ground information. The option shown in (17c) is a distant third in preference, but it does show that it is possible to have the ground information repeated, and also that modifications in word order and pausing are made for emphasis; that is, unlike Catalan, which allows all possible variations of right dislocated constituents, ASL has a preferred sequence for redundant information when it does occur.

A similar situation obtains in (18), this time with only one antecedent for the subject. The echo question who? now reflects a request for information which the addressee did not catch (Completion Focus; Ferro 1993):

(18) A: Kay was driving her Dad’s new sports car and ran into a tree. 
B: WHO was driving his car? 

English

<table>
<thead>
<tr>
<th>A</th>
<th>It was Kay who was driving his car.</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>A: KAY THAT (DRIVE CAR)</td>
</tr>
</tbody>
</table>

Here again, the repeated information who was driving his car is acceptable (but not required) in English and is usually omitted but possible in ASL. The ASL form involves the focuser THAT (Wilbur 1994b). (19) provides a situation in
which the repeated information may *not* be omitted in ASL in response to an echo question for an object NP that the addressee did not catch (Completion Focus):

(19) A: I told Kay she should consider going into counseling.  
B: You told WHO?  
\[ \text{ASL} \]
\[ \text{English} \]
\[ \text{lb} \]
\[ \text{br} \]
A: Kay.  
It was Kay who I told.  
\[ \text{A: KAY THAT, TOLD FINISH} \]
\[ *\text{KAY (THAT)} \]

What we have seen so far is that ASL allows but avoids repetition of cross-turn information, while English easily permits such information; Catalan also permits such information but it is right dislocated. Repetition of cross-turn redundant information is more acceptable in ASL when the focused material is an object (19), as opposed to a subject (17, 18). The key to the acceptability of such information in (19) is the presence of THAT, an ASL focuser that must always follow its focus associate. Recall Fischer's suggestion that the ASL equivalent of the it-cleft is a cleft with THAT. In (18) and (19), the form 'NP THAT, XP' is a cleft it was NP who XP. It was Kay who was driving; It was Kay who I told (Wilbur 1994b). Delin (1992) discusses the fact that the function of tail information in clefts is more to remind the hearer than to assert to the hearer (or to mark a substitute, as in non-cleft structures). Thus, the presence of tail information in these cleft examples is unremarkable.

What remains to be shown is how ASL treats ground information when the focus is offered as substitute information, that is, that ASL does require tail information in exactly those situations described by Vallduvi. Consider (20), which is from Aarons (1994), and the unacceptable options, which are from my data:

(20) \[ \text{br} \]
JOHN NOT-LIKE JANE. MARY, HE LOVES  
\[ *\text{MARY (THAT)} \]
\[ 'John doesn't like Jane. It's MARY he loves.' \]

Here, Mary is the focus which is offered as the correct information as to who it is that John loves; the tail *he loves signals that Mary is a substitute to be put into the listener's entry of *John loves Jane. Note that the English allows a cleft for the corrective clause *It's Mary he loves while ASL does not. English can signal that Mary is the focus by shifting stress; ASL puts Mary in final position in its clause by preposing/topicalizing it out of the core clause (which some dialects of English can also do). Thus, (20) provides evidence that ASL can use tails as Catalan does, to serve an information packaging function. The two languages differ with respect to their treatment of tails that do not serve such a function, Catalan permitting multiple tails and ASL strongly preferring to omit non-functional tails.

Consideration of this functional distinction provides a means for distinguishing two ASL structures with apparently identical syntax, Topicalization for Contrastive Focus purposes (21), which Lambrecht (1994) calls *contrastive focus*, and Topic followed by traditional Comment/Assertion (22), with the function of the Topic to identify or reintroduce who is being talked about:

(21) \[ \text{br} \]
\[ \text{Focus} \]  
\[ \text{Tail} \]  
\[ \text{JIM LOVE TEASE [t]} \]
\[ (Jim doesn't like to tease Jane.) 'It's MARY who Jim loves to tease.' \]

(22) \[ \text{br} \]
\[ \text{Focus} \]  
\[ \text{Tail} \]  
\[ \text{JIM LOVE TEASE} \]
\[ (As for Mary, Jim loves to tease her.) \]

Focus information in (21) is provided in contrast to other information that the speaker believes the hearer holds in knowledge store; no link will occur in the same sentence. In (22), the link establishes (or re-establishes) Mary as the topic of discussion and asserts about her that Jim loves to tease her. The focus information is not intended to replace existing information with respect to either Mary or Jim, and no tail is used.

There are two further implications of this analysis for actual production, one for the stress marking and the other for the non-manual marking of topics. MARY in (21) is a focus and should receive primary stress for the entire sentence; in (22), the primary stress for the sentence should appear in the clause JIM LOVE TEASE (our data indicate that LOVES is the usual location, this being the head of the final VP constituent).

Aarons (1994) discusses three types of non-manual marking for topics (phonetic details of which will not be discussed here). Of these, tm1 is used only on topics which may be considered to have been moved from their original position; in the case of (21), Mary is presumably the underlying object argument of *tease* and hence would be predicted to occur only with tm1. In (22) MARY is a plain topic and should have tm2 marking, which Aarons identifies as serving to change discourse topic (among other functions).
4. Typological Implications

4.1. Same goal, different strategy

From a typological perspective, it is important to appreciate the implications of the differing behavior of ASL and Catalan with respect to focus. ASL and Catalan diverge in two ways with respect to how the focused item ends up in final position.

First, Catalan makes extensive use of Right Dislocation (RD) of ground information, with one or more phrases that, in essence, leave behind the focused constituent in final position in the main clause. ASL, however, makes little use of RD and frequently omits ground material.

Second, Catalan has strict SVO word order in the main clause, but free word order among multiple RDs (as illustrated in [16]; Vallduvi 1991). ASL also has basic SVO word order, but more freedom is allowed in the main clause. Fischer (1990) notes the possibility of minitopicalization - fronting of lexical items particularly if the item is definite. Her analysis is consistent with the idea offered here, that a constituent which is not the focus of a sentence is moved out of final position to avoid being construed as focus. This type of movement gives the impression that ASL shuffles word order (hence the long-standing debate over whether it has a basic word order). In actuality the movement possibilities are considerably more limited than the term shuffling might suggest, and as Fischer observed, are primarily leftward (see further discussion in Wilbur 1994a, 1995a).

In sum, Catalan and ASL both prefer stress in final position and ensure that focused constituents appear in that position. Catalan accomplishes this by heavy use of rightward movement while maintaining strict SVO ordering of whatever remains in the main CP; in contrast, ASL tolerates word order movement within the main CP and relies on deletion or leftward preposing of non-focused material to ensure that the focus phrase appears in final position. The critical prosodic requirement that both languages must meet is that of final prominence in the main assertion. The critical information packaging requirement is that focused information must receive prosodic prominence. The two languages use different strategies to achieve the same goal.

I will now turn to the typological implications of the above observations. There has been a tendency in linguistics to divide languages into two mutually exclusive groups: configurational and non-configurational, or, more recently, discourse configurational (Kiss 1995). On this basis, I initially separated English from Catalan, Russian, and ASL. Vallduvi's work on Catalan provided an excellent opportunity for comparison with ASL, and his typological parameter of Plasticity provided a prosodic basis for the division of English from Catalan and ASL, and a motivation for surface word order variations in languages with fixed phrasal stress. Yet, within the [-plastic] group, careful examination of the differences between ASL and Catalan suggested further subdivision. Both languages are SVO, hence configurational in the traditional sense. Within the main clause, ASL allows focused material to move rightward around non-focused material to final position (examples 5-9) while Catalan retains strict SVO order and must move non-focused material out of the main clause until the focused material remains in final position. Catalan is more rigid in word order than ASL. Outside the main clause, Catalan allows free order among the moved constituents, while ASL moves non-focused material leftward or omits it.

Preliminary analysis of the facts of Spanish indicate that it is also a member of the [-plastic] group. Moreover, Spanish is like ASL and unlike Catalan in the determination of surface word order. Jiménez (1995) discusses the information status of Spanish subjects that appear in pre-verbal, post-verbal, and sentence-final positions, noting that pre-verbal subjects are discourse links and post-verbal and sentence-final subjects are in focus, with the sentence-final subjects more specifically in contrastive focus. As a result, various word orders may occur in the main clause (SVO, OVS, SOV) and these orders are determined by discourse roles (Ocampo 1995). In Catalan, if the subject occurs in the main clause, it must be pre-verbal to maintain SVO word order. Also, Spanish, like ASL, omits the subject if it is simply redundant (that is, not a link, not contrastive, or not in focus). Spanish, then, is [-plastic], has various word orders allowed in the main clause, omits redundant material and does not make heavy use of R.D. Spanish patterns with ASL more than with Catalan.

Further consideration of differences between English and Russian reveal that parallel distinctions must be made within the [+plastic] group as well. There is a clear contrast between English, which determines word order in accordance with grammatical relations, and Russian, which determines word order on the basis of discourse roles. Clearly, the single parameter [plastic] is insufficient to capture the differences between English and Russian, and between Catalan and Spanish/ASL. These differences are not prosodic in nature, but rather reflect whether a language prefers to give greater prominence to grammatical relations (which results in more rigid word order) or discourse/informational status (which results in more flexible word order). There is a need for another parameter to capture how languages differ on the relative priority of grammatical and discourse relations; I will term this the Grammatical Relation parameter. [+GR] indicates grammatical relations have primacy; [-GR] indicates that discourse roles have primacy. The following possibilities result:

Table 1.

<table>
<thead>
<tr>
<th>[+GR]</th>
<th>[- Plastic]</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catalan</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1.
With a language sample of only 5, it is difficult to make generalizations, whether these categories represent meaningful typological distinctions among languages remains to be demonstrated. However, the suggestion here is that surface word order is not fully explained by the location of stress and information packaging, but that languages differ on the extent to which discourse relations that are reflected in the information packaging interact with within-sentence grammatical roles.

4.2. Same structure, different function/goal

There is one further observation on the difference between ASL and English that needs to be made. We saw that English permits plain and reversed predicate nominations and wh-clefts; this was explained as the result of English allowing stress shift. If focused information is final, stress and focus are together. If focused material is other than final, then stress must be shifted to achieve togetherness of focus and prominence. In ASL, non-focused material that is not omitted must be preposed (unless in a cleft, which has been identified as a frequent exception; Collins 1991a,b). Clearly, preposing serves different functions in the two languages. In English, the presence of preposing is primarily a pragmatic issue, occurring in situations in which the appropriate contexts for inversion are met (Ball 1991, Birner 1992, 1994, Birner and Ward 1993, Coopmans 1989, Ward 1988, Ward and Birner 1994). In ASL, preposing is part of syntactic-prosodic-pragmatic conspiracy to put focused information in final position with stress and is therefore required as a consequence of the absence of stress shift (Wilbur 1994a, c, 1995a). Put another way, the absence of stress shift in the prosodic component requires assistance from the syntactic component to achieve desired pragmatic-informational goals.

Acknowledgments

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Endnotes

1. Jiménez (1995) offers an information packaging explanation for Spanish that would seem to apply to the Catalan example in (3), namely that the subject appears post-verbally when the entire sentence is in focus. Sentence-initial subjects in Spanish are links, and sentence-final subjects are themselves in focus.


**Part II:**

**Grammatical Morphemes versus Lexical Units**