# Positive evidence, preemption and parameter resetting in second language acquisition

by

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Abstract

Within the framework of generative grammar, it is assumed that children are endowed with an innate language faculty called Universal Grammar (UG). Children learn their native language on the basis of the interaction of positive evidence in the input with the principles and parameters of UG. In terms of parameter setting, positive evidence consistent with just one value of a parameter causes the preemption of any incorrect settings hypothesized by the child, in accordance with the Uniqueness Principle (Pinker 1984, Wexler and Culicover 1980) which ensures that only one parameter setting can be held at a time in the child's grammar (Berwick 1985).

This thesis investigates the operation of preemption in parameter setting in second language (L2) acquisition in cases where the learner initially adopts the L1 value of a parameter. Focussing on a parametric difference between French and English, namely, the verb movement parameter (Pollock 1989) which relates to (among other things) the placement of adverbs, 58 grade 5 francophone students learning English as a second language in intensive programmes in Québec schools were exposed over a two week period to a flood of positive evidence on adverb placement in English - input which was consistent with only the English value of the parameter. The results indicate that the subjects did not reset the verb movement parameter to the English value, suggesting that preemption does not function in L2 as in L1 acquisition. Possible explanations for these results and their implications for theories of L2 learnability are developed.

Résumé

Dans le cadre de la grammaire générative, on considère que les enfants sont dotés d'une faculté linguistique innée que l'on nomme la Grammaire Universelle. Les enfants apprennent leur langue maternelle à partir de l'interaction des données linguistiques primaires avec les principes et les paramètres de la Grammaire Universelle. En termes d'organisation paramétrique, les données positives compatibles avec une seule valeur paramétrique causent la préemption de valeurs incorrectes présumées par l'enfant, conformément avec le Principe d'Unicité (Pinker 1984, Wexler and Culicover 1980) lequel assure qu'une seule valeur paramétrique à la fois soit adoptée dans la grammaire de l'enfant (Berwick 1985).

Cette thèse étudie le fonctionnement de la préemption dans l'apprentissage des valeurs paramétriques dans l'acquisition d'une langue seconde dans le cas où l'apprenant adopte initialement la valeur de la langue maternelle d'un paramètre. Pour y arriver, on exploita une différence paramétrique entre le français et l'anglais découlant du paramètre de la montée du verbe (Pollock 1989) lequel est relié (entre autre) à la position de l'adverbe. Pendant une période de deux semaines, 58 étudiants francophones du niveau de la 5ième année, apprenant l'anglais comme langue seconde dans le programme intensif des écoles du Québec, furent inondés de données positives sur la position de l'adverbe en anglais : données compatibles avec la valeur paramétrique de l'anglais seulement. Les résultats indiquent que les sujets n'ont pas acquis la valeur paramétrique de l'anglais, suggérant que la préemption ne fonctionne pas dans l'acquisition d'une langue seconde comme elle le fait dans l'acquisition d'une langue maternelle. Des explications possibles de ces résultats ainsi que leurs conséquences vis-à-vis les théories de l'apprentissage de la langue seconde sont ici proposées.

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## Table of Contents

# Introduction

Children master their mother tongue quickly and with apparent ease, simply through exposure to the language in their environment. Within the framework of generative grammar adopted here, it is assumed that human beings are endowed with an innate language faculty, called Universal Grammar (UG). UG contains invariant principles and variable parameters which constrain what is a possible human language and permit the acquisition of any natural language by the child.

The child appears to accomplish the task of acquisition on the basis of only primary linguistic data - that is, the sentences he or she hears. Clearly, the child is not explicitly taught everything he or she knows about his or her language. Indeed, much of the native speaker's knowledge of his or her language is unconscious knowledge. In addition, it is widely held that error correction does not play a crucial role in grammatical development, since children can and do learn their native language without it. Acquisition, then, results from the interaction of the innate language faculty with the linguistic input - an interaction which is sometimes assumed to be mediated by certain language specific learning principles to which the child also has access. Apparently, the child comes to the acquisition task very well-equipped to learn his or her language rapidly and with total success. This is not always true of second language (L2) learners.

L2 learners differ from first language (L1) learners in that they come to the acquisition task with previous knowledge of a language - knowledge which may influence the kinds of assumptions they make about the L2, and which may lead them at times to make incorrect assumptions that are difficult to overcome. In other words, the interaction of UG, the input and the learning principles may be affected by an additional factor in second language acquisition (SLA) - knowledge of the L1. This thesis investigates the role of positive evidence and one of the proposed learning principles, the Uniqueness Principle, in parameter setting in SLA.

One structure which has proved difficult for French learners of English as a second language (ESL) and which appears to be influenced by the L1 is the placement of adverbs in English (White 1989b). This property may be linked to a proposed parameter of UG, the verb movement parameter. In this thesis, we will investigate the resetting of the verb movement parameter by French learners of English. In particular, we will explore whether French learners can reset the verb movement parameter to the English value on the basis of positive evidence alone.

This thesis will report the results of an experimental study in which ample positive evidence on the English value of the verb movement parameter did not permit French learners of English to reset the parameter to the English setting. The implications of this for theories of learnability in SLA, in particular preemption, as well as possible reasons for the failure of positive evidence in this case will be proposed.

In Chapter 1, the motivations for and contents of UG will be presented and a potential role for UG in L2 acquisition will be discussed. Chapter 2 will further develop the concept of parameters of UG - the verb movement parameter (Pollock 1989) will be introduced and discussed. In Chapter 3, issues relating to learnability in L1 and L2 acquisition will be developed. In particular, we will focus on preemption and the Uniqueness Principle as they have been proposed for L1 (Pinker 1984, Berwick 1985) and L2 acquisition (Rutherford 1989). Chapter 4 will provide an account of an experimental study which investigates the role of positive evidence in the resetting of the verb movement parameter in SLA. In general, this study shows that positive evidence alone is insufficient to trigger parameter resetting in this case. In Chapter 5, possible explanations for the results of this study will be presented and their implications will be developed.

## Chapter 1 Universal Grammar and language acquisition

Human language is unique among communication systems in that it is creative, flexible and abstract (Lightfoot 1982). The acquisition of this complex system is universal (all "normal" children acquire at least one language) and rapid (given the complexity of the knowledge acquired, L1 acquisition occurs over a relatively short period of time).

A central goal of modern linguistics is explaining how humans acquire language, with such speed and apparent ease. Within the framework of generative grammar, it is assumed that human beings are genetically endowed with a cognitive faculty specific to language. Language acquisition, under this view, is the development from the initial innate state of knowledge to the final mature grammar. The initial state of knowledge is Universal Grammar (Chomsky 1981: 34), the contents of which delimit what is a possible human language. The native speaker's steady state of knowledge is his or her *grammar* - a psychological entity which has a representation in the mind (Lightfoot 1982: 25).

Language acquisition is clearly influenced by the learner's linguistic environment, in that the child will learn the language to which he or she is exposed. The native speaker must, therefore, induce some aspects of his or her knowledge (vocabulary, for example) from the input. But the native speaker attains other, more subtle knowledge of his or her language which is not so easily explained as resulting from linguistic experience. Explaining language acquisition, then, involves identifying the source of this abstract knowledge.

The first step in explaining how language is acquired is to make explicit what it is that the native speaker eventually comes to know about his or her language. On the basis of the discrepancy between the attained knowledge and what is derivable from the input, we can begin to postulate what information must be encoded in the innate language learning mechanism. One of the goals of generative grammar is to identify the contents of UG, which must meet a double challenge - UG must be sufficiently structured that it accounts

for universally successful L1 acquisition in the face of limited linguistic evidence, yet sufficiently free that it accounts for the acquisition of any natural language (Chomsky 1981 3). The first of these conditions relates to the logical problem of language acquisition, which is discussed in section 1.1 below. The second condition, discussed in section 1.2, is addressed in UG through the encoding of certain restricted options, called "parameters" (Lightfoot 1982: 42).

## 1.1 The logical problem of language acquisition

UG is motivated by the logical problem of language acquisition (Baker and McCarthy 1981, Chomsky 1981, Hornstein and Lightfoot 1981, among many others) which is this: the (largely subconscious) knowledge of language attained by the mature native speaker - called linguistic competence - is subtle and complex, and includes knowledge for which there is no direct evidence in the linguistic input. The logical problem of language acquisition refers to the discrepancy between what is available in the learner's linguistic input and the final state of knowledge he or she attains. How does the child acquire knowledge which is not derivable from the input data? Within this framework, the source of that knowledge is UG.

### 1.1.1 Deficiencies of the input

The input to which the child is exposed suffers from a triple deficiency (Hornstein and Lightfoot 1981: 9-10). Firstly, it does not consist entirely of complete, grammatical sentences. Language in use is imperfect, containing incomplete utterances, slips of the tongue, hesitations etc. - none of which come marked as ungrammatical for the learner. If the child accepts these imperfect utterances as valid, the task of discovering the correct grammar should be much more difficult than it actually appears to be, indicating that, for

some reason, children are not misled by this type of "degenerate" data.[1] Within the framework of generative grammar, UG ensures that the learner is not confounded by such data.

Secondly, the child is exposed to only a finite number of utterances in the language he or she is learning. Nonetheless, he or she is eventually able to produce and understand an infinite number of sentences. The native speaker's ability to use language creatively cannot be explained simply through exposure to the subset of possible structures he or she encounters in the input. Some other factor must be intervening - namely, UG.

The final and by far most serious deficiency of the input is the fact that it underdetermines certain aspects of the language. That is, there is nothing in the sentences the child hears which could lead to knowledge of certain properties of the target language grammar - properties which native speakers nonetheless come to know. For example, there are certain constraints on the formation of wh-questions in English which native speakers learn, but which are not derivable directly from the input.

In English, wh-words can be moved to sentence initial position to form questions.

(1) a. John saw a ghost.

b. What$_i$ did John see $t_i$?

c. Mary believed that John saw a ghost.

d. What$_i$ did Mary believe that John saw $t_i$?

(White 1989a: 8)

Sentences (1b) and (1d) are question forms of the declaratives in (1a) and (1c) respectively. Now, consider (2).

[1] It has been argued that degenerate input is rarely directed at children and hence, plays no role in L1 acquisition (Brown 1977). Nevertheless, the other deficiencies, most importantly the problem of underdetermination discussed below, still remain to be explained.

(2) a. Mary believes the claim that John saw a ghost.

b.*What$_i$ does Mary believe the claim that John saw $t_i$?

(White 1989a: 9)

On the face of it, the wh-question (2b), based on the declarative in (2a), appears to follow the pattern in (1); yet, (2b) is ungrammatical in English. Children learning English are not taught that they cannot say (2b) - how, then, do they come to know that (2b) is impossible? This knowledge is assumed to stem from UG. The principle underlying the ungrammaticality of (2b) is the subjacency principle, which restricts syntactic movement to over a maximum of one bounding node. Fronted wh-phrases, for example, must obey subjacency - bounding nodes in English being CP, IP and NP.[2,3] The intervening bounding nodes for (2b) are shown in (2b').

(2) b'.*What$_i$ [$_{IP}$does Mary believe [$_{NP}$the claim [$_{CP}$that [$_{IP}$John saw $t_i$]]]]?

(2b') shows that the wh-word <u>what</u> has crossed four bounding nodes in moving to sentence initial position - one CP, two IPs and one NP. (2b) is ungrammatical, therefore, due to a subjacency violation. Since there is no direct evidence in the input that sentences like (2b) are ungrammatical, the relatively complex and abstract principle of subjacency is assumed to be encoded in UG.

[2] CP (formerly S') = Complementizer Phrase, IP (formerly S) = Inflection Phrase; NP = Noun Phrase

[3] There is some debate as to whether CP is a bounding node in English. It will be assumed here that it is

### 1.1.2 Negative evidence

The deficiencies of the input discussed above could conceivably be overcome if children were receiving negative evidence - information about what is ungrammatical in their native language. However, this appears not to be the case.

Early investigation into the role of negative evidence in first language acquisition (Brown and Hanlon 1970, Braine 1971) indicated that negative evidence is unavailable to or ignored by the learner. Later studies (Hirsch-Pasek et al. 1984, Bohannon and Stanowicz 1988) have suggested that negative evidence (in the form of differential repetition of grammatical as opposed to ungrammatical utterances) is available and useful, thus diminishing the need for an innate component. There are several problems with this proposal (Pinker 1989, White 1989a). Firstly, feedback is not provided for all ungrammatical utterances, leaving the child to decide whether absence of negative feedback indicates grammaticality - an incorrect assumption which could have serious consequences for the child's developing grammar. Secondly, not all children receive such feedback. Different cultures, socioeconomic classes and individuals pay varying degrees of attention to errors in child speech. Conceivably, some children receive no negative evidence at all, yet the acquisition of one's mother tongue is universally successful. Negative evidence, therefore, cannot be necessary for language acquisition, whatever its potentially facilitating effect, and acquisition in its absence remains to be explained. A third problem with the usefulness of repetition and recasting (involving repetition with correction) as negative evidence concerns the vagueness of such feedback. The same responses (i.e. repetition, recasting, clarification questions) are provided for semantic, phonological, syntactic and morphological errors (Pinker 1989: 11). It must often be difficult, therefore, for the child to determine which element is the "offender" in need of correction. A final problem concerning the usefulness of negative evidence relates to the child's sensitivity to correction. Anecdotal examples from Braine (1971) and others (McNeill 1966) indicate

that children either pay no attention to the feedback they receive or incorporate it improperly into their utterances (i.e. applying the correction to the wrong item). In neither case does correction serve to make the utterance "more grammatical" in any sense.

A final point to be made concerning negative evidence in L1 acquisition relates to the absence of certain errors in child speech. In general, children do not make mistakes of the type in (2b) (Otsu 1981, White 1989a); therefore, such errors are surely not corrected. Children, nevertheless, come to realize that (2b) is ungrammatical and, unconsciously, obey subjacency. Given that negative evidence is irrelevant here, and that positive evidence relating to the subjacency principle is not directly available in the input, knowledge of the restrictions imposed by subjacency must come from somewhere else. Innate knowledge in the form of UG is a plausible source.

## 1.2 Contents of UG

UG imposes linguistic constraints of two kinds. Principles like subjacency, some form of which hold in all languages,[4] account for the universal aspects of human language and restrict the class of possible grammars. As mentioned above, UG must also be free enough to account for the diversity of human languages. This flexibility is achieved through the second type of constraint - parameters - which encode certain options in UG. Parameters represent the choices available for the instantiation of a property of UG in the grammar of a particular language. These choices, called parameter settings, are selected on the basis of linguistic experience. The child hears data in the input that are consistent with only one of the possible parameter settings and selects the setting appropriate for his or her language accordingly. A single parameter relates several properties of the language; therefore, different settings for a single parameter can result in quite diverse surface

[4] A principle holds in all languages for which that principle is relevant. Subjacency, for example, is not relevant to a language without movement.

contrasts between languages (Chomsky 1981: 4). The assumption is, then, that the child need hear only minimal evidence regarding one of those properties in order to arrive at the correct parameter setting. In this way, the acquisition of certain language specific structures can take place on the basis of positive evidence alone.

Subjacency provides an example of parametrization of a principle of UG. As discussed above, wh-movement is restricted to movement across a single bounding node (CP, IP and NP in English). Such distance restrictions apply in all languages having movement; however, there is variation among languages as to the choice of bounding nodes. Consider the Italian sentences in (3).

(3) a. Tuo fratello, $[_{CP}$a cui$_i$ $[_{IP}$mi domando $[_{CP}$che storie
your brother to whom myself I-ask which stories
$[_{IP}$abbiano raccontato $t_i$ $[_{IP}$era molto preoccupato]]]]]
they-have told was very worried
"Your brother, to whom I wonder which stories they have told, was very worried."

b.*Tuo fratello $[_{CP}$a cui$_i$ $[_{IP}$temo $[_{NP}$la possibilità $[_{CP}$che
your brother to whom I-fear the possibility that
$[_{IP}$abbiano raccontato tutto $t_i$...]]]]]
they-have told everything ...
"Your brother, to whom I fear the possibility that they have told everything..."

(van Riemsdijk and Williams 1986: 71-2)

In Italian, the bounding nodes are CP and NP, but not IP. This accounts for the facts in (3). (3a) is grammatical because the wh-phrase a cui has crossed a single bounding node - CP. In (3b), on the other hand, a cui has moved over two bounding nodes - CP and NP -

resulting in a subjacency violation. This variation between English and Italian indicates that the choice of bounding nodes is parametrized in UG. The child need only hear a sentence like (3a), in which a wh-phrase has crossed two IPs in order to reject the English value of the parameter (CP, IP and NP) and adopt the correct parameter setting for Italian (CP and NP).[5]

Incorporating such parametric variation into UG is crucial in supplying it with the power to explain the acquisition of all human languages. This thesis will investigate the operation of parameters in L2 acquisition. Do parameters function the same way in L2 acquisition as in L1 acquisition? To begin, we discuss whether there exists a comparable motivation for UG in L2 acquisition - that is, is there a logical problem of L2 acquisition?

## 1.3 The logical problem of SLA

In order to show that a logical problem exists in L2, as in L1 acquisition, we must establish two facts about SLA. Firstly, it must be shown that L2 learners do indeed end up with knowledge that extends beyond what is derivable from the input data. Secondly, the poverty of the stimulus argument must be shown to hold for input to L2 learners - that is, the deficiencies of the input and absence of negative evidence must prove to apply in SLA. Each of these conditions is discussed below.

### 1.3.1 Ultimate level of attainment

Perhaps the most striking difference between L1 and L2 acquisition concerns the ultimate level of competence attained by learners. All "normal" children attain native speaker competence in their first language. In SLA, on the other hand, failure to attain

[5] Another setting for this parameter is also possible. In some languages (i.e. Russian) IP and CP may be bounding nodes.

native speaker competence is the norm. Moreover, the final state of L2 learners' grammars varies considerably. Some learners attain very high levels of competence, while others acquire only rudimentary knowledge of the L2 grammar. While these facts clearly indicate a divergence between L1 and L2 acquisition, they by no means indicate that L2 learners do not attain knowledge that goes beyond what is directly available in the input. As White (1985a) states:

> " let us rather concentrate on those learners who are relatively successful, and who *(sic)* success involves not just the ability to communicate but to communicate with some degree of syntactic accuracy Such learners will presumably end up with unconscious knowledge as to what is and is not grammatical in the L2, and this will include knowledge about relatively complex structures, " (p. 33)

Given that some L2 learners do attain high levels of competence in the target language, it remains to be shown that the input to which they are exposed is deficient in ways similar to that of L1 acquisition.

### 1.3.2 Deficiencies of the input

The first problem with the input in L1 acquisition is that of degenerate data. Discovering the correct rules of the target grammar is greatly complicated by the existence of ungrammatical sentences in the input (in the form of incomplete utterances, hesitations, mistakes etc.). L2 acquisition which takes place in truly naturalistic settings will suffer from essentially the same degenerate input as in L1 acquisition (assuming again that such input exists, but see Brown 1977) In formal (classroom) and some naturalistic settings, learners are often exposed to simplified input in the form of teacher or foreigner talk, and hence may not have to deal with such imperfect data. Even so, the logical problem of SLA

is clearly not eliminated. The problem of underdetermination (see below) remains, and it seems likely that simplified input of this type would only magnify this deficiency since more complex structures would then be avoided in the input (White 1989a: 40)

The second deficiency discussed for L1 acquisition involves the finite nature of the input. Hearing only a finite number of the sentences of the language, children nonetheless acquire the ability to produce and understand an infinite number. Since L2 learners, in both naturalistic and formal settings are exposed to only a subset of the sentences possible in the target language, this problem must hold for SLA as well.

The most challenging problem with the L1 input is the fact that the input underdetermines the grammar attained by the native speaker. Sharwood Smith (1988) outlines the problem of underdetermination in the L2 input:

> "To summarise the argument for second language research however rich the communicative context of utterances addressed to the language learner and however helpful the native speakers are or teachers may be, there are subtle and complex features of human languages that cannot be provided by the usual kind of input nor even by the usual type of correction and explanation given to language learners, that is, even in a formal classroom where there may be a lot of metalinguistic explanation Hence the input tends to be *structurally* impoverished whatever it does provide in semantic or pragmatic terms, it does not, by hypothesis, furnish the learner with enough relevant evidence to work out certain subtle principles and constraints that characterise the native-speaker grammar, i e the grammar is "underdetermined" by the environmental input "
>
> (emphasis his, p. 14)

Since successful L2 learners, like native speakers, attain knowledge of certain complex structural properties and of ungrammaticality in the L2 in spite of this deficiency, UG must also play a role in SLA.

1.3.3 Negative evidence

As discussed in section 1.1.2, the existence of negative evidence could diminish the need for an innate component to account for language acquisition. Just such evidence is sometimes available in SLA. In the classroom, L2 learners are often instructed on aspects of the target grammar and their errors are often corrected. There are two problems with dismissing UG in SLA on the basis of these facts. Firstly, learners acquiring the L2 naturalistically presumably do not receive negative evidence which could account for high levels of target language competence. According to Rutherford (1989):

> "This is not to deny that negative feedback is available to the learner, for we know that it is available in certain familiar contexts (e.g., formal classroom instruction), it is only to recognize that L2 learning of at least some portions of the target language by at least some learners can and does occur without it."
>
> (emphasis his, p. 442)

Secondly, often negative evidence is provided in response to errors. If an error never occurs, it will never be corrected. Generally, like L1 learners, the mistakes that L2 learners make do not appear to involve violations of subtle principles like subjacency and other principles of Universal Grammar (White 1989a: 41). Similarly, complex structures like those relating to the properties of UG are not taught in the classroom. Presumably then, learners do not receive correction or instruction on those aspects of the target language. As in L1 acquisition, this knowledge must come from UG.

It appears that the logical problem of language acquisition challenges theories of L2 as well as L1 learning. While this view is widely (but not universally) held, there is much

debate as to what role, precisely, UG plays in SLA (Rutherford 1986). Several contrasting positions are reviewed below.

## 1.4 The role of UG in SLA

Overall, there are three major claims concerning the role of UG in SLA: 1) UG is not functional in SLA (Bley-Vroman 1989; Clahsen and Muysken 1986, Schachter 1988) 2) UG is fully functional (Mazurkewich 1984, 1988) and 3) UG is functional but is mediated through the L1 (Flynn 1987; Phinney 1987; White 1988). The third position will be adopted in this thesis. In justification of this, the evidence for each claim is reviewed below.

### 1.4.1 UG is not functional in SLA

Proponents of this view claim that the differences between L1 and L2 acquisition point to a fundamentally different learning process in L2 acquisition, which does not involve UG. This is the approach adopted by Bley-Vroman (1989), Clahsen and Muysken (1986) and Schachter (1988).

Concerned with parameter resetting in SLA, Schachter (1988) argues that L1 and L2 acquisition are inherently different processes; therefore, parameter resetting may be irrelevant in SLA (p. 222). Schachter supports her view with a list of basic differences between L1 and L2 acquisition, including completeness (L2 learners, unlike L1 learners, rarely acquire native speaker competence in their L2), equipotentiality (while the rate of acquisition and level of competence attained is virtually the same for all L1 learners, L2 learners' final states of knowledge vary considerably), previous knowledge (while the L1 learner is being exposed to language for the first time, the L2 learner already knows a language) and fossilization (while children tend not to use incorrect linguistic forms once

the grammatical equivalent has been acquired, L2 learners sometimes revert to earlier forms in certain circumstances). On the basis of these differences, Schachter claims that the processes of L1 acquisition are not the same as those of L2 acquisition. Adult L2 learners may have access to aspects of UG encoded in the L1, but other properties of UG are not available.

A similar view is held by Bley-Vroman (1989). Based on evidence of much the same kind (citing differences between L1 and L2 acquisition, including, among others, lack of success; variation in success, route and learning strategies; and a role for affective factors in SLA), Bley-Vroman claims that the role UG plays in L1 acquisition is fulfilled in SLA by knowledge of the L1. Under this view, parameter resetting is not possible, but aspects of UG encoded in the L1 are still available

Other researchers (Clahsen and Muysken 1986) adopt an even stronger version of the claim for a non-functional UG. They propose that while an innate component does account for L1 acquisition, the adult L2 learner uses general learning strategies to acquire the target language. Unlike Schachter and Bley-Vroman, Clahsen and Muysken do not allow for the possibility that L2 learners may access properties of UG encoded in their L1. Under their view, UG is totally unavailable.

Both versions of this claim (namely, that only aspects of UG encoded in the L1 are available and that UG itself is totally inaccessible) are challenged by research indicating that parameters may be reset (Hilles 1986; Phinney 1987; White 1988) and that principles of UG are obeyed in the L2 even if they are not relevant in the L1 (Ritchie 1978; Otsu and Naoi 1986, cited in White 1989a).

### 1.4.2 UG is fully functional

A second possibility is that UG is fully accessible in SLA (Mazurkewich 1984, 1988). This view implies that L1 and L2 acquisition are essentially the same processes. The L2

learner brings to the acquisition process universal principles and open parameters. Interaction between the L2 input data and an operative UG permit the setting of new parameter values for the L2, just as in L1 acquisition. This position is challenged by research showing that L2 learners sometimes adopt the L1 parameter setting as their initial hypothesis about the L2 (Hilles 1986, White 1985b, 1988, 1989b, 1991a).

1.4.3 UG is functional but is mediated through the L1

The final position - the one adopted in this thesis - is that UG is functional in SLA but that knowledge of the L1 also plays a role. Evidence for this claim comes from studies investigating parameter resetting in cases where the L1 parameter value differs from that of the L2 and resetting is shown to be successful (Hilles 1986; Phinney 1987, White 1988). A study investigating the acquisition of parametrized aspects of subjacency - namely, bounding nodes - provides an example.[6]

White (1988) investigated the acquisition of the English parameter setting by adult native speakers of French learning ESL in an intensive program. As discussed above, bounding nodes in English are NP, IP and CP. French, like Italian, has a different setting for this parameter, with the bounding nodes NP and CP. This study examines the performance of two groups of adults on structures involving movement over several bounding nodes. As we are concerned here with parameter resetting, only those structures relating to differences between the L1 and L2 parameter settings will be reviewed - namely, extraction from wh-clauses as in (4).

[6] White's study also investigates aspects of the Empty Category Principle which will not be reviewed here.

(4) a. John wondered [$_{CP}$whether [$_{IP}$Mary had chosen a good book]]

b.*Which book$_i$ [$_{IP}$did John wonder[$_{CP}$whether [$_{IP}$Mary had chosen $t_i$]]]?

(White 1988: 147)

(4b) is ungrammatical in English since the wh-phrase has crossed three bounding nodes two IPs and a CP. A learner who assumes the French value of the parameter (that IP is not a bounding node) should accept (4b), since in that case, the wh-phrase would have crossed just one bounding node (CP), hence not violating subjacency.

The results on the two tasks testing this structure show that the two groups of adults performed differently as regards acceptance of IP as a bounding node. Both groups had acquired structures of sufficient complexity to require adherence to subjacency in English. However, the first group (G1) accepted wh-island violations significantly more often than did the the second group (G2). G2, on the other hand, tends to accurately reject wh-island violations. White accounts for this difference between the groups as resulting from parameter resetting. G1 has retained the L1 parameter setting, assuming that IP is not a bounding node and hence, accepting sentences as in (4b). G2 has reset the parameter to the English value, accepting IP as a bounding node and accurately rejecting sentences like (4b).[7]

This study suggests that the L1 parameter setting may indeed be assumed in the target language (G1), but that resetting of the parameter to the correct L2 value is possible (G2). UG must be available, then, but its functioning is affected by the L1.

[7] It should be noted that the two groups studied did not differ significantly on a cloze test measuring overall proficiency in English. The differences they display on this aspect of English grammar are therefore unexpected.

## **Chapter 2** The verb movement parameter

This chapter will provide an overview of the verb movement parameter - the parameter underlying the structure investigated in the experiment to be reported in this thesis. The data motivating the verb movement parameter will be reviewed and a recent formulation of the parameter (Pollock 1989) (the formulation adopted in this thesis) will be presented. In essence, the verb movement parameter accounts for certain word order contrasts between French and English as related to the "strength" of agreement (AGR), which is subject to parametric variation among languages. French, having a rich agreement system, adopts one value of the parameter (strong AGR), while English, showing morphologically poorer agreement adopts the opposite value (weak AGR).[1] Several contrasts between French and English word order fall out from this single parametric difference.

### 2.1 Emonds (1976)

Verb raising was originally proposed to account for the appearance of <u>have</u> and <u>be</u> before negatives and adverbs in English - positions in which lexical verbs are ungrammatical.

(1) a. * They got not examined.
    b. They were not examined.

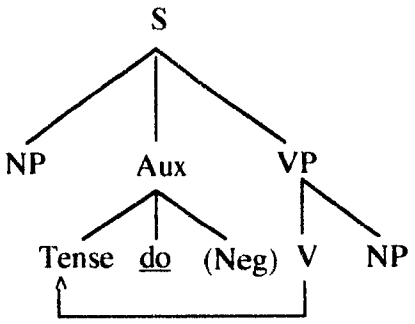
(2) a. * John visits frequently his parents.
    b. He has frequently visited his parents.

(Emonds 1976: 214-215)

[1] In Pollock's framework, strong AGR is "transparent" while weak AGR is "opaque" (Pollock 1989: 391). These terms are clarified below.

(1) and (2) above show that while main verbs may not precede the negative particle not and adverbs like frequently in English, have and be are grammatical in this position. Emonds (1976) assumes that, in contrast to lexical verbs, the auxiliary verbs (and lexical have in British English) raise to Tense. Within Emonds' framework (depicted in (3)), the category AUX contains a Tense node, the verb do and an optional negative particle. If the verb under VP at D-Structure is have or be, an obligatory rule forces verb movement to AUX.

(3)




(adapted from Emonds 1976: 212)

Pre-adverbial and pre-negative auxiliaries are ungrammatical in infinitival clauses.[2] Since nonfinite sentences were considered to lack a Tense node, these facts could be accounted for simply, as there was no node available for movement (Jackendoff 1972: 78).

(4) a. For John not to be the man I'm looking for disturbs me.

b. * For John to be not the man I'm looking for disturbs me.

(Jackendoff 1972: 78)

[2] In fact, Pollock makes the opposite claim. He accepts have/be pre-negatively in nonfinite clauses (see section 2.2.3)

## 2.2 Pollock (1989)

### 2.2.1 The data: finite verbs

Pollock (1989) and Chomsky (1989), following this work by Emonds, appeal to verb movement to account for certain contrasts between French and English. Pollock formulates a parameter which deals with contrasts like the following.

(5) a. * Jean likes not Mary.
    b. Jean n'aime pas Marie.

(6) a. * Likes he Mary?
    b. Aime-t-il Marie?

(7) a. He hasn't understood.
    b. Il n'a pas compris.

(8) a. Has he understood?
    b. A-t-il compris?

(9) a. * John kisses often Mary.
    b. Jean embrasse souvent Marie.
    c. John often kisses Mary.
    d. * Jean souvent embrasse Marie.

(10) a. He is seldom satisfied.
    b. Il est rarement satisfait.

(Pollock 1989: 367-70)

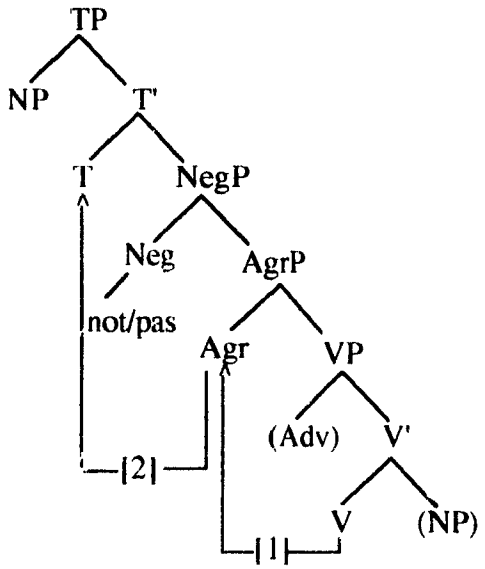
The sentences in (5) show that while main verbs precede the negative element pas in French (5b), this order is ungrammatical in English (5a). In (6) we see that while lexical verbs cannot precede the subject (he) in English questions (6a), this order is perfectly

grammatical for pronominal (but not lexical) subjects in French (6b). The sentences in (7) and (8) show that aspectual verbs (a/has) on the other hand, can appear in those positions in both French and English. In (9) we see that lexical verbs may not precede the adverb in English (9a), while in French, this order is fine (9b). In English, the adverb must precede the main verb as in (9c), an order which is ungrammatical in French (9d). (10) shows that, in contrast, the auxiliary verbs may surface pre-adverbially in both languages.

2.2.2 The analysis

Pollock proposes that French and English share the following D-Structure.[3]

(11)




(adapted from Pollock 1989: 397)

[3] TP = Tense Phrase, the head of which is Tense (T); NegP = Negative Phrase, the head of which is Negative (Neg), AgrP = Agreement Phrase, the head of which is Agreement (Agr); VP = Verb Phrase, the head of which is Verb (V); Adv = Adverb

Under this analysis, INFL in English and French is actually composed of two nodes the Tense node, which heads the maximal projection Tense Phrase (TP) (previously IP) and the Agreement node, the head of the maximal projection Agreement Phrase (AgrP). A third maximal projection, NegP, intervenes between these two in negative sentences. Adverbs are base generated in an optional VP-initial position. Movement from V-position into AGR (depicted by arrow [1] in (11)) is termed short movement by Pollock. Movement that passes through AGR but continues on to the Tense node is called long movement (depicted by the combination of arrows [1] and [2] in (11)). In French, all finite verbs must undergo long movement through AGR and into Tense. This fact accounts for the data in (5) to (10). The (b) sentences in (5) to (8) and in (10) are grammatical since the finite verbs, both lexical (5b and 6b) and aspectual (7b, 8b and 10b), precede the negative element, the adverb and the subject in questions, indicating that they have indeed moved out of VP and into (AGR and) Tense (through Tense in the case of questions). This movement is obligatory as shown by the ungrammaticality of (9d), in which the lexical verb embrasse follows the adverb, indicating that it has not raised out of its VP (and hence over the VP-initial adverb). In English, only have and be undergo long movement in finite clauses, thus accounting for the data in (1) and (2). Similarly, the ungrammaticality of (5a), (6a) and (9a), in which a lexical verb precedes the negative element, the subject in questions and the adverb, proves that movement of lexical verbs is forbidden. Lexical verbs must remain in their VP (and hence, follow negatives and adverbs) in English sentences (9c). Sentences (7a), (8a) and (10a) are grammatical since have and be are, exceptionally, subject to long movement.

In this thesis, the crucial contrasts are those depicted in (9). Due to the obligatoriness of finite verb movement in French, main verbs in SVO sentences must precede the adverb in French (9b), while in English, that order is forbidden (9a). On the other hand, given that verbs remain in their VPs, adverbs must precede lexical verbs in English sentences (9c), while in French, this order is ungrammatical (9d).

2.2.3 The data: nonfinite verbs

In French infinitival clauses, only avoir and être may undergo movement (through AGR) to Tense. Lexical verbs may not move past AGR. They may, however, surface pre-adverbially in AGR position. These facts are depicted in (12).

(12) a. N'être pas heureux est une condition pour écrire des romans.
"To be not happy is a prerequisite for writing novels."

b. * Ne sembler pas heureux est une condition pour écrire des romans.
"To seem not happy is a prerequisite for writing novels."

c. N'avoir pas eu d'enfance heureuse est une condition pour écrire des romans.
"To have not had a happy childhood is a prerequisite for writing novels."

d. * Ne posséder pas de voiture en banlieue rend la vie difficile.
"To own not a car in the suburbs makes life difficult."

e. A peine parler l'italien après cinq ans d'étude dénote un manque de don pour les langues.
to hardly speak Italian after five years of study denotes a lack of gift for languages
"To hardly speak Italian after five years of hard work means you lack a gift for languages."

f. Parler à peine l'italien après cinq ans d'étude dénote un manque de don pour les langues.
to speak hardly Italian after five years of study denotes a lack of gift for languages
"To speak hardly Italian after five years of hard work means you lack a gift for languages." (Pollock 1989: 373-378)

(12a) to (12d) show that while the auxiliaries (12a and c) can appear pre-negatively (and hence in Tense position), lexical verbs (12b and d) cannot raise to Tense (and past the negative element pas) in infinitival clauses. On the other hand, lexical verbs can precede adverbs (12f); therefore, short movement (to AGR) must be possible. In English, Pollock claims, long movement (entailing movement through AGR) of have and be is possible[4] while even short movement is not permitted for lexical verbs as the sentences in (13) show.

(13) a. Not to be happy is a prerequisite for writing novels.

b. ? To be not happy is a prerequisite for writing novels.

c. Not to have had a happy childhood is a prerequisite for writing novels.

d.(?) To have not had a happy childhood is a prerequisite for writing novels.

e. * To seem not happy is a prerequisite for writing novels.

f. * To speak hardly Italian after five years of hard work means you lack a gift for languages.

(Pollock 1989: 376-382)

Have and be may appear both pre-negatively (13b and d) and post-negatively (13a and c), indicating optional movement to Tense. Nonfinite lexical verbs, on the other hand, may not precede adverbs or negatives in English, indicating that short (13f) and long (13e) movement are impossible for those verbs.

To recapitulate, the differing values of the verb movement parameter result in several surface contrasts between French and English. All finite verbs and nonfinite avoir and être move (through AGR) to Tense in French, where they may precede the negative particle

[4] The judgements on (13b) and (13d) are not uncontroversial (see Iatridou 1990: 568-9). Pollock justifies their acceptability by contrasting dubious judgements on those, with clear judgements of ungrammaticality on sentences involving long movement of lexical verbs as below.
(1) *To seem not happy is a prerequisite for writing novels (Pollock 1989: 376)

pas. Lexical verbs in nonfinite clauses are subject to short movement in French - they may surface pre-adverbially in AGR position. In English, the aspectual verbs have and be (and lexical have in British English) are subject to long movement in both finite and infinitival clauses, where they may precede the negative particle not. On the other hand, both finite and nonfinite lexical verbs never undergo short or long movement in English, and hence they must surface following the negative particle not and adverbs in VP-initial position.

2.2.4 The parameter

As mentioned above, French/English contrasts like those in (5) to (10) and (12) and (13), are related to the strength of agreement in those languages, on Pollock's account. The morphologically poor agreement of English reflects the fact that AGR is weak in English. In contrast, French, with its morphologically richer agreement system, has strong AGR. Pollock proposes a transparency/opacity parameter which states that weak AGR (English) is opaque to theta-role assignment, while strong AGR (French) is transparent to theta-assignment. Within Pollock's framework, verb movement is a process of adjunction whereby the V and AGR form an amalgamated element of the category AGR. Since weak AGR blocks theta-role assignment, verbs which adjoin to AGR in English are unable to assign their theta-roles, hence resulting in a violation of the Theta Criterion, which states:

> Each argument bears one and only one theta-role, and each theta-role is assigned to one and only one argument.
>
> (Chomsky 1981: 36)

On the other hand, when AGR descends via affix movement to attach to the verb in English, the resulting unit is of the category Verb. In this case then, opaque AGR does not interfere with theta-assignment and no theta-violation has occurred. French AGR, being

morphologically richer, is transparent to theta-assignment and hence a verb's theta-roles can be assigned despite its amalgamation with AGR following movement.

The lexical restrictions observed in English and French on long movement in infinitival clauses are attributed to the assumption that [-finite] tense (the defining characteristic of infinitival clauses) is, like weak AGR, also opaque to theta assignment.

These facts can account for the observed lexical restrictions on verb movement in French and English. Recall that, in English, only the aspectual verbs have and be (and lexical have in British English) undergo long movement in tensed and untensed clauses. In French, all verbs move (through AGR) to Tense in finite clauses, while in infinitival clauses, only avoir and être (and modals) are subject to long movement. Pollock accounts for this fact by claiming that have/avoir and be/être do not assign theta-roles.[5] With these verbs, therefore, opaque elements (weak AGR in English and [-finite] tense in both English and French) have no theta-assignment to block and the resulting moved structures are well formed.

As is evident in examples (5) to (10) above, the choice of value on this single parameter affects several aspects of word order in French and English. The properties associated with this parameter include negative placement, adverb placement and question formation. French, with the transparent value of the parameter, permits lexical verbs to move to Tense (and AGR in infinitival clauses), thus main verbs precede the negative particle pas, VP-initial adverbs and the subject in questions. Both finite and nonfinite auxiliaries precede the negative particle pas, VP-initial adverbs and subjects in questions. English, having the opaque parameter value, forbids movement of lexical verbs in both finite and infinitival clauses, hence main verbs may not precede the negative particle not, VP-initial adverbs and

[5] Since certain uses of have/avoir and be/être (i.e. lexical have/avoir indicating possession and existential be/être) are not easily dismissed as being non-theta-assigning, Pollock discusses the theta-assigning status of these verbs (and modals) in some detail (pp. 386-390). Since nothing crucial in our experiment hinges on explaining the lexical restrictions on verb movement, it will not be discussed further here.

the subject in questions. Auxiliary verbs on the other hand, undergo long movement in tensed and untensed clauses in English, and hence may precede these elements.

For first language acquisition, the data required to set the correct value of this parameter are simple and pervasive. The child need only hear a main verb (without an aspectual verb) in a single finite sentence containing a negative particle, a sentence internal adverb or in question form, in order to determine the correct value of the verb movement parameter. Since this data is available in common sentences containing a single main clause, there is no reason to believe that this parameter is not set immediately upon (or very shortly after) exposure to the language. Since the behaviour of aspectual verbs and lexical have/avoir is identical for both values of the parameter, it must be assumed that these verbs do not play a role in the setting of this parameter. In English a single negative sentence or question containing do-support, or an adverb preceding a main verb in a simple finite clause could be sufficient evidence that verb movement is not permitted in English (and hence, that English agreement is opaque). In French, exposure to a single negative sentence or question in which a lexical verb precedes the negative particle or subject, or to an adverb following a main verb in a simple finite clause could trigger setting of the parameter to the transparent value, hence allowing verb movement. Because the crucial data is so simple and common for both values, there is no reason to assume that the child starts out with an unmarked value of the parameter which must later be reset. The child merely waits for the crucial evidence, which due to its pervasiveness in the input he or she must encounter almost immediately, and sets the parameter accordingly.

For the purposes of this thesis, the correctness of Pollock's claim about the detailed structure of INFL, is, in fact, orthogonal to the issues being discussed in this thesis.[6] The verb movement parameter affects at least three aspects of word order in French and English

[6] Indeed, Pollock's claim has recently been challenged by Iatridou (1990) who argues convincingly against the existence of AgrP in English and French. Instances of "short" movement, she claims, are actually related not to verb movement, but to the syntactic behaviour of adverbs.

- negative placement, (sentence internal) adverb placement and question formation. In this thesis, we are focussing on the effects of the verb movement parameter on the position of adverbs in relation to lexical verbs in finite clauses. In particular, we are concerned with the distinction depicted by the sentences in (9). Verb raising, obligatory in French, results in the surface order Subject-Verb-Adverb-Object (henceforth SVAO). The adverb may not precede the verb in French. English, permitting (and requiring) verb movement for only have and be, has sentences of the form Subject-Adverb-Verb Object (henceforth SAV), and forbids the SVAO order of French. Whether the moved verb passes through two nodes (AGR and Tense) in the course of its movement, or moves directly into a simple INFL node is irrelevant. As soon as the verb raises out of its VP, it must pass over the VP initial adverb position. This is the crucial aspect of verb movement in this study. Where the verb ends up once it leaves the VP and crosses the adverb position, will not affect our results.

Here, we have presented the syntax relevant to the structure investigated in the present study. We have seen how differences in adverb placement between French and English can be related to a single parameter of UG and we have considered the type of evidence which learners may use to set the verb movement parameter to the appropriate value. In the next chapter, we consider issues related to language learnability. We will introduce the Uniqueness Principle, a learning principle proposed for L1 acquisition, focussing particularly on the role of the Uniqueness Principle in the setting of parameters, like the verb movement parameter, in L1 and L2 acquisition.

## Chapter 3 Learnability and preemption

In addition to the restrictions imposed by UG on what is a possible language, certain learning principles have also been proposed which aid the child in overcoming the logical problem of language acquisition. These principles are contained in a module partially separate from UG (Wexler and Manzini 1987), but which interacts with the principles of language. The learning module and UG are parts of a larger module which is specific to language. Successful language acquisition and usage depend on the interaction of the subcomponents of this language module. The acquisition of parameter settings, for example, depends on the interaction of the learning principles and parameters of UG (Wexler and Manzini 1987: 41). One learning principle which may come into play in parameter setting, is the Subset Principle. Generally, the Subset Principle states that "learning hypotheses are ordered in such a way that positive examples can disconfirm them" (Berwick 1985: 23). In terms of parameter setting, the Subset Principle ensures that given data compatible with two grammars, one of which generates a subset of the other, the parameter setting generating the subset language will be adopted first by the child (p. 237). By progressing in this manner, disconfirming positive evidence (i.e. sentences generated by only the superset grammar) will be available if the most restrictive setting is incorrect. When faced with a parameter of UG, then, the Subset Principle determines which of the possible parameter settings is "most restrictive" (i.e. generates the subset grammar), and hence constrains the order in which parameter settings will be adopted during the course of acquisition.

Another principle proposed for the learning module is the Uniqueness Principle. In general, the Uniqueness Principle is a one-to-one principle constraining form-meaning mappings such that one meaning can be carried by just one form in a grammar. This chapter will focus on the Uniqueness Principle and its role in L1 and L2 acquisition.

The Uniqueness Principle comes into play in situations where the child hypothesizes an incorrect lexical or morphological form or structure which has a grammatical counterpart in the target grammar. Assuming that negative evidence about the language is not available, the child must overcome such mistakes on the basis of positive evidence alone (Rutherford 1989: 443). Positive evidence for the grammatical form is available in the input, hence its acquisition does not pose a problem, rather the learning problem here involves the loss of the incorrect form from the child's grammar. There is apparently nothing in the input which could indicate to the child that the ungrammatical form is not also possible, and force its expunction from his or her grammar. Apparently then, positive evidence alone is insufficient to permit the child to overcome errors of this kind. The Uniqueness Principle has been proposed to address precisely such problems of learnability.

One example of the child hypothesizing an incorrect form is the extension of regular inflectional morphology to irregular stems - resulting in the usage of overregular past tense forms like *breaked* and *goed* (Pinker 1986: 58). On the face of it, there is no positive evidence which could indicate to the child the ungrammaticality of the overregular form - it is simply non-occurring. That is, if the child assumes that *breaked* is a possible form, there is apparently nothing in the sentences the child hears to indicate that this is not the case. To overcome this error, the overregularized forms must drop out of the child's grammar, thus narrowing the scope of application of the morphological rule to only the target stems. Since children do eventually work out the rule of regular past in English, something, besides negative evidence, must be permitting the child to restrict his or her overregular grammar. The mechanism that ensures that the child overcomes such errors and eventually arrives at the adult grammar is often called *preemption* (Pinker 1984, 1986; Berwick 1985; Rutherford 1989).

Preemption has figured in several learning principles proposed for L1 acquisition, including the Principle of Contrast (Clark 1987), Unifunctionality (Slobin 1985), the Principle of Competition (MacWhinney 1987) and the Uniqueness Principle (Wexler and

Culicover 1980; Pinker 1984, 1986; Berwick 1985). In general, preemption ensures a one to-one mapping such that a single meaning is mapped onto one morphological feature or syntactic relationship. When two different forms encoding the same meaning are in competition, only one can be retained In this manner, the child can expunge the inappropriate form from his or her grammar. Once he or she realizes that two forms (i.e. *breaked/broke*) are performing the same function (i.e. *break + past tense*), one of those forms must be preempted (Rutherford 1989). It is assumed within the framework discussed here that the form attested in the input is the one that will be retained.

In this thesis, we will focus on preemption as instantiated by the Uniqueness Principle. This chapter will review the role of preemption in L1 acquisition (Pinker 1984, 1986) - particularly in parameter setting (Berwick 1985). We will also discuss a potential role for preemption in SLA (Rutherford 1989), specifically, as regards parameter resetting and the experimental study to be reported later.

## 3.1 The Uniqueness Principle

In its original form (Wexler and Culicover 1980), the Uniqueness Principle constrained relationships between syntactic structures - namely, one deep structure was represented by a single surface structure in the unmarked case. Two surface representations for a single deep structure would only be tolerated by the learner if he or she consistently encountered both in the input. This one-to-one mapping ensured that the meaning associated with a particular deep structure could be unambiguously derived from its surface form.

The Uniqueness Principle was later applied to other components of the grammar by researchers like Roeper (1981) (who used it to account for the acquisition of subcategorizations), Grimshaw (1981) (who appeals to it in the expunction of miscategorized lexical items) and Pinker (1984, 1986) who invokes Uniqueness in the acquisition of aspects of the lexicon (syntactic categories of lexical items), morphology

(inflectional morphemes) and syntax (phrase structure rules). In this chapter, we focus on Pinker's formulation and application of the Uniqueness Principle.

It has been proposed that children succeed in mastering their L1 because they approach the acquisition task conservatively - that is, they assume the most restrictive grammar first. Only in the face of evidence in the input contradicting the narrowest grammar will the child abandon it and adopt a less restrictive grammar. This conservative approach ensures that during the course of acquisition, the child never creates a grammar that is too general (i.e. containing the grammatical as well as ungrammatical sentences of the target language), thus obviating the need for negative evidence. By always assuming the narrowest grammar compatible with the input, positive evidence is available to disconfirm incorrect forms.

Pinker argues that this idealistic view of language acquisition simply cannot be maintained in light of the developmental data. He discusses several examples of non-conservative learning (i.e. the application of regular rules of morphology to irregular stems, the miscategorization of lexical items), all of which result in inappropriate forms in the child's grammar. In each case, Pinker appeals to Uniqueness in overcoming the incorrect grammar.

> "The principle is that the need for negative evidence in language acquisition can be eliminated if the child knows that when he or she is faced with a set of alternative structures fulfilling the same function, only one of the structures is correct unless there is direct evidence that more than one is necessary. The phrases 'set of alternative structures,' 'fulfilling the same function,' and 'direct evidence' are intentionally vague, they must be replaced with precise definitions every time I appeal to some version of the principle. Nonetheless, the principle, which allows the child to discard structures even when there is no negative feedback indicating that they are ungrammatical, can be recognized in a variety of guises."
>
> (Pinker 1984: 113)

On Pinker's account, only structures created by productive mechanisms are subject to preemption. If a form is created productively by the child, and an alternative form bearing the same meaning is heard in the input, the attested form will preempt the productively created form and only one will be retained. However, if both forms occur in the input, neither is subject to preemption and both will be used by the child. Below, Pinker's appeal to preemption in the expunction of overregularized morphological forms of the *breaked/broke* variety will be reviewed.

### 3.1.1 Overregularizations

Consistent with his paradigmatic model of the acquisition of inflection, Pinker invokes a version of preemption called the Unique Entry Principle which stipulates that "no complete set of grammatical feature values may be encoded by two or more distinct morphemes" (Pinker 1984: 177). Within this framework, morphological features can be represented in both word specific and general paradigms. In word specific paradigms, every inflected form of a single word (or as many as are known by the learner) is listed independently for each grammatical person. In general paradigms on the other hand, only the inflections (without a lexical stem) are listed. For example, the word specific paradigm for a verb would include the past tense form of that verb for each grammatical person (i.e. 1st person *looked*, 2nd person *looked* etc.), while the general paradigm would list only the regular past tense inflection (*-ed*).

The learner's productive use of inflectional morphology results from the application of the affix listings of the general paradigm to a partially completed word specific paradigm to fill out the rest of its cells. It is precisely this procedure which results in the production of overregularized past tense verb forms in the child's language (i.e. *breaked, goed*). According to Pinker, since this is a productive process, any form thus created is marked as

preemptable and will be expunged from the grammar upon exposure to a form in the input competing for its cell in the paradigm. In this way, once the child hears *broke* and *went*, the overregularized form will be preempted from the paradigm. In cases where two forms are possible in the adult language (i.e. *dived/dove*), neither will be marked as preemptable and the child will retain both (Pinker 1984: 195)

The Uniqueness Principle is thus crucial in overcoming errors of this sort. The child's overapplication of the regular past tense rule results in a grammar that generates ungrammatical, overregularized forms which are non-occurring in the adult grammar. Here, positive evidence alone could not indicate to the learner that both forms (one created through productive processes and the other attested in the input) are not possible. The Uniqueness Principle ensures that the overregular form is expunged from the child's grammar, thus making it more target-like.

### 3.1.2 Domains of the Uniqueness Principle in L1 acquisition

A crucial issue regarding the Uniqueness Principle concerns the domains in which it can be expected to hold. Pinker (1984) suggests several possibilities. If, as claimed by some (Bolinger 1975), there is no true synonymy in languages, it can be assumed that the child adheres to a semantically based Uniqueness Principle that holds in all domains of the grammar. On the other hand, Uniqueness may be instantiated differently in different components of the grammar - for example, playing a role in inflectional paradigms, but saying nothing about alternative phrase structure expansions (Pinker 1984: 361). The child may, then, come to the acquisition task expecting Uniqueness to apply in certain domains and not others.

One area of the syntax in which the Uniqueness Principle and preemption have been claimed to play a role in L1 acquisition is parameter setting. Uniqueness was first discussed in relation to parameter setting by Berwick (1985) who formulated the

Uniqueness Principle as follows: "...if there are two or more alternative settings of a single parameter, only one is permitted to survive" (p. 95).

Parameter settings are triggered on the basis of sentences in the input. At least some of the structures generated by one value of a parameter are incompatible with an alternate value. This ensures that settings can be selected on the basis of positive evidence alone - that is, upon hearing structures consistent with only one value of the parameter, the child can adopt the appropriate value for the language he or she is learning. In some cases, however, the initial parameter setting is not correct for the language being learned. For example, some parameters are assumed to have a "default" setting - a value preset by UG. When this default value is appropriate for the L1, it is maintained; however, in some cases, the default value is different from the L1 parameter setting. Within Berwick's framework, the parameter can be reset from the default to the L1 value through adherence to the Uniqueness Principle, which restricts the number of settings that can be held for a single parameter to one. On the basis of positive evidence consistent with a value other than the default, the learner would deduce that an alternate setting was appropriate for his or her language. Since both settings cannot survive, one will be expunged. As above, the setting (most frequently) consistent with the input is retained (Berwick 1985: 184). One example of resetting of a parameter from the inappropriate default to the correct L1 value is provided by Hyams (1986) who investigates the acquisition of the prodrop parameter.

### 3.2 Preemption and parameter setting in L1 acquisition

Hyams (1986) investigates the prodrop parameter in L1 acquisition.[1] The prodrop parameter accounts for variation across languages as to the grammaticality of null subjects. Languages like Spanish and Italian (which have the [+prodrop] value of the parameter)

[1] The prodrop parameter is also known as the null subject parameter (Rizzi 1982) and (in Hyams' terms) the AG/PRO parameter

permit the omission of subject pronouns while in other languages, like English and German (which have the [-prodrop] setting), explicit pronominal subjects are required.

Based on a crosslinguistic study of grammatical development (English/Italian/German), Hyams claims that all children start out with the default ([+prodrop]) value of this parameter - an assumption that accounts for several characteristics of the developing grammars of native speakers of English (i.e. the optional omission of lexical subjects, the absence of lexical expletives and the lack of modals and auxiliary *be*). Children learning non-prodrop languages like English must reset this parameter to the [-prodrop] value. Again, since negative evidence is not an option, the crucial data - that which triggers a change from the [+] to the [-] value - must be readily available in the input. According to Hyams, three structures could cause the child to become aware that [+prodrop] is the incorrect value for English - 1) the usage of lexical expletives (which are obligatorily absent in Italian and Spanish); 2) referential pronouns used where they would be pragmatically unnecessary in a [+prodrop] language; and 3) modals and auxiliaries used in sentence initial position in yes/no questions (forcing the [-prodrop] analysis which permits elements in INFL) (Hyams 1986: 108). The issue of which of these elements actually triggers the switch is irrelevant to our discussion. What is crucial is that once the child has noticed the relevant data (whatever it may be), parameter resetting, through preemption of the default, will occur. While the data relating directly to the null subject property is negative in nature (i.e. the child would need to notice the *absence* of null subjects in English) positive evidence relating to one of the other properties of the cluster (for example, lexical expletives) is sufficient to trigger resetting. Upon noticing the triggering data the child would realize that the default setting ([+prodrop]) is incorrect for the language he or she is learning and adopt the value compatible with his or her language

Since the Uniqueness Principle restricts to one the number of parameter settings which can be maintained at a time, adoption of the setting compatible with the triggering data ([ prodrop]) would automatically force preemption of the default ([+prodrop]) value. This

predicts that once the child starts producing structures consistent with the new setting (i.e. using lexical expletives), all the properties which cluster with the parameter should emerge (i.e. the child should also start consistently providing lexical subjects, using modals and auxiliaries etc.) indicating that the parameter has indeed been reset. The developmental data reported by Hyams appear to support this prediction.

It appears, then, that parameter resetting in L1 acquisition proceeds, in some cases, on the basis of preemption motivated by a formulation of the Uniqueness Principle which permits just one parameter setting to be maintained at a time.

### 3.3 Preemption in SLA

To overcome the logical problem of language acquisition, the task of L1 acquisition is assumed to be facilitated in two ways. Firstly, innate knowledge provided by UG limits the types of information the child must derive from the input data. Secondly, access to learning principles, like the Uniqueness Principle, ensures that the child avoids overgeneral grammars and discovers the correct target grammar. Thus, the child can master the native language without ever having recourse to negative evidence.

Given that the same logical problem is faced by L2 learners (as argued in chapter 2), it is reasonable to question whether the same sources of knowledge are available to the L2 learner. As for UG, it is assumed in this thesis that UG is available to L2 learners, but that its functioning is affected by the L1. The question remains: Do L2 learners have access to learning principles, like the Uniqueness Principle, which facilitate the task of language acquisition? The progressive development of interlanguage (IL) grammars towards the target grammar - a process involving the replacement of ungrammatical forms in the IL by their grammatical counterparts - seems to indicate that some form of preemption does play a role in IL development. It is worth investigating, therefore, if and to what extent preemption operates in SLA, whether it is motivated by comparable versions of

Uniqueness, in what domains it applies etc. Formal investigation into the operation of learning principles like Uniqueness in SLA can shed light on all these issues. This thesis will investigate whether preemption operates in parameter setting in L2 as in L1 acquisition.

While preemption in its various forms has been discussed rather extensively in the L1 acquisition literature, it has largely been ignored in relation to SLA - the work of Rutherford (1989), who discusses a potential role for preemption in adult SLA, being a notable exception.

### 3.3.1 Rutherford (1989)

Any approach to learnability in SLA must account not only for competence which extends beyond the input, but also for the consistent failure of L2 learners to achieve native-like levels of attainment. In particular, the phenomenon of fossilization (cases where the learner appears incapable of overcoming certain non-target forms) points to the failure of preemption in SLA, in that the target form encountered in the input clearly fails to replace the incorrect IL form. Fossilization and the lower levels of competence attained in SLA in general suggest that theories of learnability based on L1 acquisition cannot be expected to apply straightforwardly in SLA. If these learning principles are accessible at all to the L2 learner, some factor must be interfering with their operation in SLA.

Rutherford, referring to Pinker's formulation of the Uniqueness Principle, states: "The essence of Uniqueness then is the priority exerted by the input data over *productive mechanisms*, where these two sources for grammatical entries have yielded competing forms" (emphasis his) (Rutherford 1989: 448). The crucial difference between this formulation, based on L1 acquisition, and Uniqueness as it must apply in SLA stems from the fact that in SLA there are three rather than "two sources for grammatical entries". In addition to the input and productive mechanisms based on the target grammar, L2 learners can also generate productive forms through the application of rules of the L1 grammar to

the L2. It is an empirical question whether the input data will also exert priority over productive forms created through such processes of L1 transfer.

Previous knowledge of a language could also affect the operation of preemption in SLA in other ways. In most versions of preemption proposed in the L1 literature, it is the learner's intolerance of synonymy which motivates restructuring of the grammar. Namely, when the learner perceives two forms as bearing the same meaning, one of two things can happen - either one form is expunged from the learner's grammar, or the apparent violation of the Uniqueness Principle triggers the search for other significant levels of meaning - that is, intolerance of synonymy forces the child to search for other semantic features which could distinguish the two forms. In SLA, on the other hand, the learner presumably knows, on the basis of his or her L1, that lexical synonyms and ambiguous sentences can exist in languages. Perhaps then, this knowledge will lead to a tolerance of synonymy such that the uniqueness of form-meaning mappings may no longer apply in the learner's grammar. Similarly, the semantic divisions established for the L1 may also affect the functioning of Uniqueness. Over the course of L1 acquisition, the child has worked out the semantic distinctions relevant for his or her language and the learner's "semantic space" is already partitioned according to those features. If the learner appeals to all available sources of knowledge in analyzing the L2, these divisions will likely be transferred (Rutherford 1989: 445). In this case, the L2 learner's expectations as to what aspects of the grammar require a unique representation may depend heavily on the semantic distinctions relevant to the L1.

### 3.3.2 Domains of the Uniqueness Principle in SLA

A precondition of the Uniqueness Principle is that in order for an inappropriate form to be preempted, a corresponding, correct form must be present in the input. This condition is clearly met in cases involving, for example, inflectional morphology; however, in other

areas of the grammar, particularly syntax, the situation is not so straightforward (Rutherford 1989: 444). Below we discuss two examples of IL development in which preemption might play a role.

As in L1 acquisition, L2 learners sometimes productively apply regular inflectional morphology to irregular stems, producing overregularized forms like *breaked* and *goed* (Dulay and Burt 1974).[2] Presumably, L2 learners overcome this error in the same manner as L1 learners - namely, through preemption. Once the L2 learner becomes aware of the irregular forms *broke* and *went* in the input, those forms could replace the overregular forms in accordance with Uniqueness. Since the overregularized forms result from productive mechanisms for the L2 learner, as for the L1 learner, (the L2 learner has presumably never heard *breaked* and *goed* in the L2 input), these forms could also be considered preemptable. They could therefore be replaced by the attested, grammatical forms.

The second example is taken from Rutherford (1989), who (based on work by Hilles 1986) discusses a potential role for preemption in parameter setting. Assuming the cluster of properties proposed in Hyams' version of the prodrop parameter, Hilles investigates the resetting of the prodrop parameter by a twelve year old Spanish subject learning English. This subject started out with the L1 value of the parameter, omitting lexical subjects and not permitting modals or auxiliaries in INFL. Over the course of grammatical development, however, the parameter is reset to the English value, resulting in a corresponding decrease in the usage of null subjects and the appearance of lexical material in INFL. Hilles also found a relationship between these changes and the emergence of expletives (the proposed trigger) in the subject's speech. Of the switch in parameter values, Rutherford states "One could also say that an IL system of modal representation arising via productive rule (i.e. L1

[2] Such overregularization often follows a stage in which the learner appears to be using the irregular forms correctly. Here, we are discussing development following this initial period of correct usage, when the learner begins to overapply the rule for regular past

transfer) is preempted by another encountered via the English input data" (Rutherford 1989: 451). Once the subject analyzed data incompatible with the [+prodrop] setting, he was forced to reset the parameter to the [-prodrop] value since both cannot be held simultaneously in his grammar.

### 3.4 Preemption and parameter setting in SLA

In section 3.2 we saw that in cases where the child first adopts a default setting inappropriate to the language being learned in L1 acquisition, the parameter must be reset upon exposure to the input data. According to Pinker, default settings constitute productive mechanisms in L1 acquisition, and hence are subject to preemption by settings instantiated in the input data (Pinker 1986: 73-4). It is worth investigating whether parameter resetting in SLA can also be approached in terms of preemption. Namely, are parameter settings generated through productive mechanisms in SLA (i.e. transfer from the L1) also "preemptable"? According to Rutherford, parameters are one domain in which preemption may be found to apply. Citing work by Hilles (1986) (see section 3.3.2), Rutherford suggests that in L2 as in L1 acquisition, input data incompatible with the initial parameter setting adopted for the L2 (often based on transfer of the L1 value) will force restructuring of the IL grammar and resetting of the parameter. Again, this is based on the assumption that once the contradictory data have been analyzed by the learner, the new setting will preempt the old, since both cannot be held at the same time.

By their very nature, parameters provide a suitable testing ground for investigating the role of preemption in SLA. Parameters link a cluster of properties such that a minimal amount of exposure to the input will lead to setting or resetting of the parameter. Furthermore, parameters function on the basis of positive evidence alone. Therefore, the data required to set a parameter are readily available in the input. For many parameters, at least some of the structures generated by one setting will be incompatible with an alternate

setting. This forces the learner to make a choice, since the input data he or she is hearing cannot be consistent with two values of a parameter. Moreover, it is implicitly assumed in essentially all accounts of parameter setting in L1 acquisition that switching to the correct value of a parameter (in cases where an inappropriate value is adopted initially) results from the preemption of the incorrect parameter setting by the correct one. Therefore, since preemption appears to be a notion fundamental to the effective operation of parameters in L1 acquisition, it is also an area suitable for investigation in SLA.

In the last section of this chapter, we review the previous work on parameter resetting in SLA on which the experimental study reported in this thesis is based. In particular we will briefly discuss White (1991a) which investigates the resetting of the parameter outlined in Chapter 2 - the verb movement parameter.

## 3.5 White (1991a)

White (1991a) investigates the role of negative evidence in the resetting of the verb movement parameter by French learners of English. Briefly, the French value of the verb movement parameter requires that finite verbs raise to Tense (via AGR), with the result that SVAO is a possible order while SAV is ungrammatical. In English, on the other hand, finite lexical verbs cannot raise out of the VP - English, therefore, permits SAV and forbids SVAO structures. Based on the assumption that L2 learners may adopt the L1 value of a parameter as an initial hypothesis about the L2, the resetting of the verb movement parameter could pose a problem for French learners of English. Learners who adopt the French value of the parameter, ungrammatically generating SVAO order in English, may have difficulty expunging this order from their IL on the basis of positive evidence alone. Because the SVAO order is non-occurring in English, there appears to be nothing in the input which could indicate to the learner that SVAO is ungrammatical. White assumes that

this is a case where positive evidence may be insufficient to trigger parameter resetting and negative evidence may be required to induce the switch to the English value.

White compares two groups of grade 5 and 6 students (aged 11-12 years) in intensive English as a second language (ESL) programmes in Québec, Canada. One group, the adverb group, received two weeks of explicit instruction on adverb placement in English, including explicit positive and negative evidence on word order in English sentences containing adverbs. The second group - the question group - received no instruction on adverbs but were instructed on question formation in English. It was assumed that this group would receive positive evidence concerning adverb placement in English through naturalistic input in the classroom - an assumption which proved to be false and, ultimately, motivated the present experimental study. In essence, what White set out to investigate is whether exposure to positive evidence alone (as provided to the question group) would cause preemption of the L1 parameter setting in the L2, or whether negative evidence would be necessary to cause preemption.

White found that both groups started out with the L1 parameter setting.[3] Only the group that received explicit instruction and negative evidence showed signs of having replaced the L1 parameter setting with that of the L2.[4] The question group, which had supposedly been exposed to positive evidence, did not show evidence of having preempted the L1 value. However, as stated by White (below), any conclusions to be drawn from this study concerning the role of positive and negative evidence in parameter setting must be tentative since the nature of the evidence available to the question group is uncertain.

[3] Because the results from these groups will be compared with the results from the experimental group from the present study (see chapter 4), only the general trends are mentioned here.

[4] Schwartz and Gubala-Ryzak (1992) challenge this interpretation of White's results, proposing that the behaviour of subjects in the adverb group actually results from the conscious application of a surface pattern taught in the classroom to the test sentences rather than a real change in the learners' grammars. This interpretation is discussed briefly in section 5.2.

"Two caveats are in order here. The first concerns the question of whether appropriate positive evidence was in fact available to the classes who were not instructed in adverb placement. Judging from audio-tapes of the teachers and from classroom observations, there is in fact very little occasion for spontaneous use of adverbs in normal interactions in a language classroom. It is possible that the differences between the groups are simply due to the fact that the adverb group got far more exposure to adverbs, and not to the fact that this exposure included negative evidence. Thus, subjects in the question condition might have failed to learn that SVAO is ungrammatical because of lack of suitable positive input rather than lack of negative input. This issue could be tested by adding a class who are 'flooded' with appropriate positive input, but no negative input. A general lack of appropriate positive input on adverb placement in the classroom may also explain why the adverb group benefited from instruction even in the case of SAV order, an order which in principle should be found in naturalistic input. Their instruction apparently was providing them with positive input that would not otherwise have been readily available."

(White 1991a: 158)

White's study shows convincingly that the instruction the adverb group received is effective in helping learners master the ungrammaticality of SVAO and the grammaticality of SAV order in English; however, because the exact nature of the evidence available to the question group is unknown, this study on its own cannot distinguish whether negative evidence or simply exposure was the key factor in accounting for the high levels attained by the adverb group. Is negative evidence crucial in learning the ungrammaticality of SVAO, or did the adverb group outscore the question group simply because the former had been exposed to more adverbs in the input? Due to the rarity of adverbs in the input provided in these intensive classrooms, it is not clear which conclusion should be drawn. The question left by White's study is this: If enough positive evidence were provided to the learners, would it be sufficient to trigger resetting of the verb movement parameter?

Restated in terms of preemption: Is positive evidence from one aspect of a parameter sufficient to motivate preemption of an incorrect setting which generates structures that are non-occurring in the L2 input? Based on the L1, francophone learners produce ungrammatical SVAO orders which are non-occurring in English. The grammars of French and English form intersecting sets in terms of adverb placement. ASVO and SVOA are possible orders in both languages but only French permits the SVAO and only English the SAV order. If preemption is operative in L2 acquisition, then evidence for the grammaticality of SAV (an order compatible with only the English setting) will be sufficient to cause the English parameter value to preempt that of the L1. However, if other factors (i.e. knowledge of the L1) interfere with preemption in L2 acquisition, positive evidence will not be enough. The research question that will be tested in this study, then, is the following:

> Will positive evidence alone be sufficient to preempt the L1 value of the verb movement parameter, i.e. to allow subjects to learn that SVAO is an impossible order in English?

# Chapter 4 Experimental study

This chapter reports on an experimental study of the resetting of the verb movement parameter by French speakers learning English as a second language and investigates the issues developed in the previous chapters - namely, the role of preemption in parameter resetting in SLA.

## 4.1 Rationale

We are interested in the operation of preemption in the resetting of the verb movement parameter, where the L1 value of the parameter generates structures which are non occurring in the L2. The research question posed in section 3.6 above leads to two possible predictions. If preemption is operative in L2 acquisition, exposure to the SAV order of English should be sufficient to trigger a switch to the English value of the parameter, leading learners to reject the SVAO order which is not generated by the English setting. If, on the other hand, knowledge of a L1 somehow interferes with the operation of preemption in SLA, or if transferred structures, unlike structures resulting from productive mechanisms in L1 acquisition, are not "preemptable", positive evidence relating to the SAV order may not lead to resetting of the parameter and expunction of the L1 setting. To test these predictions, francophone learners of ESL were exposed to positive evidence on adverb placement in English - particularly the SAV order - and their treatment of adverbs before and after exposure were measured to determine if, indeed, preemption had taken place.

## 4.2 Method

### 4.2.1 Subjects

The subjects for this experiment were grade 5 francophone students in intensive ESL programmes in Québec, Canada. The intensive programme is offered to grades 5 and 6 students in many francophone schools throughout Québec. Students in this programme undertake one year of intensive study which is divided into two major sessions. During one half of the school year (approximately 5 months) the students are taught (in French) the regular subject areas that make up the grade 5 or 6 programme. Students spend the other half of the school year in an intensive ESL classroom. This amounts in total to approximately five hours of ESL instruction per day for a period of five months. These classes, usually of about 30 students, are devoted entirely to the study of ESL. Instruction is communicative in approach; therefore classroom activities, which focus on the use of English in context, encourage the students to interact with the teacher and with each other. Form focussed instruction is not required or even encouraged, although the exact quantity of focus on form varies according to the teacher. Upon entering these programmes, students have had very little exposure to English apart from approximately two hours of ESL per week in grade 4 (the first year ESL is introduced in Québec schools). Generally, they have very little contact with English outside the school setting. (For more information on the intensive ESL programme, see Spada and Lightbown 1989.)

The experimental group in this study - called the flood group - consisted of two grade 5 classes (n=58) (average age 11 years 2 months). For a two week period, these classes were exposed to a flood of input focussing on adverb placement through materials developed specifically for this purpose. The group received no form-focussed instruction or error correction on adverb placement in English. They simply heard adverbs used in

context through a variety of classroom activities (see section 4.2.3 for details of the classroom materials).

In order to ensure that the subjects were comparable in terms of their overall exposure to and knowledge of English, subjects completed a questionnaire to determine the amount of previous exposure to English, their knowledge and usage of English and their knowledge and usage of other languages besides English and French. Subjects who learned English before French, as well as all bilingual subjects (i.e. subjects who spoke French and any other language) were eliminated from the analysis. This resulted in the exclusion of four subjects, leaving a total of 54 for the analysis.

Throughout section 4.4, the results from the experimental group described above are compared to those of the subjects reported in White (1991a). That study involved two experimental groups and a control group. The subjects in the experimental groups were also students in the same intensive ESL programmes as the subjects in the present study. As mentioned in section 3.6, there was an "adverb group" (n=82), which received two weeks of explicit instruction on adverb placement in English, including positive and negative evidence through form-focussed instruction and error correction. The second group, called the question group (n=56), received no modified input on adverb placement in English, but were instructed on question formation. They received no positive or negative evidence which focussed on English adverbs. The controls were a group of monolingual native speakers of English in grades 4 and 5 (n=26).

### 4.2.2 Timetable and research design

As mentioned above, most children have had very little contact with English prior to enrollment in the intensive programme. Their knowledge of English at the start of the programme is, therefore, rudimentary. For this reason (and for the purposes of comparability with the study by White 1991a), the period of intensive exposure to English

adverbs was undertaken after the children had been in the programme for some time. On the assumption that after several months of "full-time" ESL instruction the students would be proficient enough to use the experimental materials, the study was conducted nearly three and a half months into the programme. A pretest was administered immediately before the modified input materials were introduced in the classroom (one class started using the materials the afternoon of the testing and the other, the next day). The materials were used for a two week period, following which the students were post-tested to determine whether the modified input had affected their behaviour on adverb placement in any way. This post-test was conducted the day after the input flood activities were completed. A second post-test was administered exactly three weeks after the first, in order to determine whether the effects measured at the first disappear immediately or endure in the short term. It should be noted that the present experiment differs in this respect from the study by White (1991a), in which the second post-test was separated from the first by a period of five weeks. Ideally, for the purposes of comparison, the second post-test would have followed the first by five weeks for this experimental group as well. Unfortunately, this was impossible, as the schools were closed for summer vacation at that time. As it was, the second post-test was conducted in the last week of the school year, giving us a maximum of three weeks between the two post-tests.

### 4.2.3 Classroom materials

The two participating teachers (both native speakers of English) were provided with a set of materials developed specially for this experimental study (for a sample of some of the classroom materials see appendix A). The activities described therein involved stories, games and exercises designed to teach the meaning of the adverbs and to allow the students to hear adverbs in context. The students were simply exposed to adverbs in the input. There was no explicit focus on the form of the sentences. The activities included, among

other things, listening to stories and answering comprehension questions, filling out partially completed questionnaires, filling in the missing word in a sentence, matching sentences with the appropriate picture, ordering sentences to make a story, writing the conclusion to a story, singing songs, reading poems, etc. all of which provided the students with positive evidence on English adverbs without teaching the rules of adverb placement. The students had very little opportunity to manipulate the order of adverbs, since the adverbs were generally provided in the correct position in the sentences of the activity. The materials focussed on adverbs of frequency (i.e. *always*, *usually*) and manner (i.e. *quietly*, *carefully*), appearing in all possible English orders, particularly SAV. As much as possible, the adverbs were used in sentences in the simple present tense. Although the spontaneous production of adverbs was not discouraged, the materials didn't leave much room for error on the part of the students

The materials were organized such that several activities (usually two) would be completed every day for two weeks. The adverb activities were usually completed during the morning session in these classes. In total, students received approximately one hour of intensive input on adverbs per day for ten school days (one class spent a total of approximately $7^1/_2$ hours and the other 10 hours on the activities) Given the rarity of adverbs in regular intensive classrooms (White 1991a), this resulted in quite intensive exposure to adverbs over a relatively short period - truly a flood of input

The teachers who participated in this study were explicitly asked not to correct errors in adverb placement and not to teach the rules of adverb placement in English,[1] so that the students would not receive negative evidence on the structure being tested The exposure was to consist then of relatively naturalistic positive evidence only. In order to verify that the activities were being carried out as intended (i.e. that children were not receiving negative evidence), the teachers were asked to record what went on in the classroom while

[1] According to the teachers, the rules of English adverb placement had not been taught in the classroom prior to this experiment.

the research study materials were being used.[2] These cassettes indicated that, at least during the class periods allocated for the experimental activities, the children were not instructed on the rules of adverb placement in English and their errors in adverb usage were not corrected.[3]

4.2.4 Testing materials

The same tasks were administered at all three test sessions. (For the tests themselves see appendix B.) These included three that were used in the previous study (grammaticality judgement task, preference task and sentence manipulation task (White 1991a)), plus a new task added specifically for the flood group (oral production task). The written tasks (grammaticality judgement and preference) were administered to the whole class at once. In total, these took approximately 45 minutes to complete. The other tasks (sentence manipulation and oral production) were administered to each student individually in a room separate from the classroom. A tape recorder was set up in this room to record the children's responses on the oral production task. In total, the individual tasks took approximately 3 hours for each class at each session (i.e. two researchers working 1 $^1/_2$ hours each). For each class, therefore, testing lasted approximately one morning session at each test occasion.

A subset of the adverbs introduced during the period of intensive exposure was tested in these tasks. They included four adverbs of manner (*quickly, quietly, carefully, slowly*) and four of frequency (*always, usually, sometimes, often*). The positions tested in the tasks included SVAO, SAVO, ASVO, SVOA, SVAPP and SAVPP; where S = subject, V

[2] While it would have been preferable, of course, to verify the classroom input for the whole two week period (and more besides), this was considered an unacceptable imposition on the participating teachers.
[3] In approximately 16 hours of taping, there is a single instance where the teacher reacts to an error in adverb placement. In this case, the teacher does not provide the correction but simply repeats the child's sentence with question intonation. The child then corrects himself.

= verb, O = object, A = adverb and PP = prepositional phrase. The tasks were aimed at the subjects' level of proficiency in terms of vocabulary and structures.

A standardized test of proficiency developed by the Ministère d'Education du Quebec (MEQ) was completed by both classes approximately one week after the first post-test. The MEQ test is an exercise of oral comprehension, during which students listen to a series of tape recorded questions and choose the correct response from several options. This evaluation is used to measure the level of overall proficiency of these classes and to determine whether they are comparable to other grades 5 and 6 intensive classes.

Several tasks were administered at each test session in the hope that such a variety would provide a clearer picture of the learners' true linguistic competence. Each of the tasks is described below. The first three were taken directly from the White (1991a) study and were not altered in any way. Only the final task was developed specially for the present experiment.

4.2.4.1 Grammaticality judgement task

The first task the children completed was a grammaticality judgement task. This task was a cartoon story told through the characters' speech and captions under each picture. Of the 33 sentences in the story, 16 involved adverb placement, and of those, four contained adverbs in ungrammatical SVAO position. Subjects were told to "fix" ungrammatical sentences by circling the word that was incorrect and drawing an arrow to the position where it would appear in a grammatical sentence. Ten sentences were grammatical and did not involve adverbs. In addition, there were seven ungrammatical distractor sentences scattered throughout the story which served to determine whether the subjects were completing the task appropriately. Subjects who altered fewer than 3 of the distractors did not receive a score for that session, since they appeared to be either incapable of completing or simply not paying attention to the task. Their performance on

the test sentences, therefore, would not be revealing their true competence as regards adverb placement. This resulted in the exclusion of 2 subjects at the pretest and at the first post-test and 3 subjects at the second post-test.

This grammaticality judgement task was chosen because the continuous story provided a context in which the sentences could be judged. As will be discussed below however (see section 4.5.1), it is likely that some of the alterations made by the subjects reflected their preferences rather than true judgements of ungrammaticality. There was a single version of this task for all subjects. It was a written task completed simultaneously by the whole class. The task tested six adverbs which appeared in several positions throughout the story. They were *usually*, *always*, *sometimes*, *carefully*, *quickly* and *slowly*.

4.2.4.2 Preference task

The second written task was the preference task. The child was presented with pairs of sentences, differing only in the positioning of the adverb. The student had to indicate whether both sentences were correct, whether only one was correct, whether both were incorrect, or that he or she didn't know by circling the appropriate response, as in the example.

(1) a. Anna drives her new car carefully.

b. Anna drives carefully her new car.

only a is right only b is right both right both wrong don't know

There were two versions of this task containing different pairs of sentences - the same adverb positions were compared in each version. There was, therefore, an A version and a B version of the task, each with different pairs of sentences but both testing the subject on 32 pairs. In addition, the sentences of both the A and B versions appeared in two orders.

For example, test A1 had the version A sentences ordered from #1 to #32, while test A2 would present the sentences of the A version in the reverse order (from #32 to #1). These variations of the task were originally proposed in the White (1991a) study to reduce possible effects for version and order. As no such effects were found in that study, the versions and orders were randomly assigned to the two classes in the present experiment.

This task was chosen because it presented the structure to be tested (adverb positions) in a context where it was the only feature distinguishing the two sentences and hence, the only feature being judged. Furthermore, since this task allowed for the grammaticality of both sentences in the pair, it helps to explicitly distinguish the subjects' judgements of grammaticality from their preferences. That is, on this task the subject was not forced to end up producing or accepting just one adverb position (as on the grammaticality judgement and oral production tasks). This task allowed for the possibility that several positions could be correct and in so doing, elicited not preferences for one order over another, but judgements of grammaticality on all possible orders.

28 of the sentence pairs on this task tested adverb placement. All test adverbs and all positions were tested in these sentences. The other four pairs contained distractor sentences which indicated whether subjects were paying attention to the task at hand. Only one subject was found to have a strong response bias (choosing almost exclusively the "both right" response) and he has been excluded from analysis at all sessions.

#### 4.2.4.3 Sentence manipulation task

The first individual task completed by the subjects was the sentence manipulation task. For this task, the subject was handed a set of cards, each containing a word. The words in each set formed a sentence containing an adverb. The child had to make as many grammatical sentences as he or she could using all the cards in the set. As each order was laid out by the child, it was recorded on a response sheet by the researcher. When the

subject could make no more grammatical sentences, he or she was given a new set of cards. Each child manipulated four sentences in this manner.

This task was chosen because it forces the child to lay out all the orders he or she considers grammatical, and hence provides a good view not only of his or her preferences but also of his or her judgements of grammaticality.

There were two versions of this task, each containing four sentences. Each test adverb appeared in one sentence. Three of the sentences contained transitive verbs with a direct object and one contained an intransitive verb with a prepositional phrase. Subjects were assigned randomly to the A or B version of the task. It took the children approximately 5-10 minutes to manipulate all four sentences.

#### 4.2.4.4 Oral production task

The second individual task that the subjects completed was the oral production task. This task, developed specially for this study, attempted to get the children to produce adverbs in a less conscious manner. It was hoped that by pressuring the students to perform orally, they would have less time to think about their responses than in the written and manipulation tasks. In this way, we hoped to tap the subjects' true linguistic competence. Whether or not this goal was achieved is, I think, debatable.

Each child was handed a cartoon picture on which was written an adverb. The child was told to create a sentence describing the picture using the word. Although this method is not entirely spontaneous, it was considered appropriate given the fact that it is extremely difficult to elicit adverbs spontaneously. Often, the meaning of an adverb can be expressed by a prepositional phrase or other structure, and adverbs can quite easily be circumvented in normal speech (as their rarity in the classroom input seems to support (White 1991a)). In any case, as we were particularly interested in the *position* of the adverb in the sentence, providing the word itself would not seriously affect the outcome of the task.

The cartoon pictures were chosen to force the usage of a direct object, so that the adverb would be tested in an SVO sentence. There were two versions of this task, each containing four sentences. Each version tested two adverbs of manner and two of frequency. In total, then, all eight test adverbs were included in this task. Children were assigned randomly to version A or B. At the pretest, a significant difference in SVAO scores was found between the A and B versions of the task (that is, subjects with the B version of the task used SVAO significantly more often than those with the A version at the pretest). This difference disappeared at the post-tests after the subjects had encountered the adverbs in the classroom. There was no significant effect for version on SAV scores at any session.

It was expected that this task would be quite difficult for these subjects, particularly at the pretest before they had encountered adverbs in class. Indeed, this fact is reflected in their behaviour and will be called upon to explain certain results discussed later (see section 4.5.3).

It is hoped that the variety of tasks described above provides for an in depth view of how, precisely, the subjects are treating adverb placement, and hence of the true state of their IL grammars.

## 4.3 Flood Group results

Overall, the results reveal that the experimental group learns that SAV is a possible order in English but does not learn that SVAO is ungrammatical. Each subject received two scores on each task at each session - an SVAO error score representing their usage of the impossible Subject-Verb-Adverb-Object order and an SAV score representing their usage of the grammatical Subject-Adverb-Verb order. (The SAV and SVAO scores for each subject on each task are listed in appendix C.) The details of the calculation of these scores for each task are described in the subsections below. Since there were no significant

differences between the two classes making up the experimental group on any task at any session, their results are presented together as the flood group.

In the following section, we compare the overall proficiency of the flood group to the adverb and question groups from the White (1991a) study, as well as many other intensive classes, as measured by the MEQ test of English proficiency. The results from the flood group on each of the four experimental tasks will then be presented. In section 4.4, they will be compared to those of the experimental and control groups from White (1991a). Finally, in section 4.5, we will show how the results on certain tasks (particularly, the grammaticality judgement task) may be linked to shifts in learner preferences rather than true changes in linguistic competence.

### 4.3.1 MEQ test

The scores of the flood group on the MEQ test of English proficiency fall well within the normal range for students in these intensive programmes. In total, the two classes making up the flood group differ significantly from only 6 of 55 other intensive classes available for comparison - the mean scores of the experimental classes falling midway between the highest and lowest reported means.[4] The flood group's mean score was 62%. The flood group's scores were also compared to those of the experimental groups from the previous study (White 1991a) on the MEQ test. Overall, the difference between the group test scores was significant ($F(2, 165) = 13.27$, $p = 0.0001$). Post-hoc Scheffé tests ($p < 0.05$) show that the flood group did not differ significantly from the adverb group (average score 59%), but did score significantly lower than the question group (average score 75%).

[4] The scores from four bilingual students who were later eliminated from the experimental results are included in the mean MEQ scores

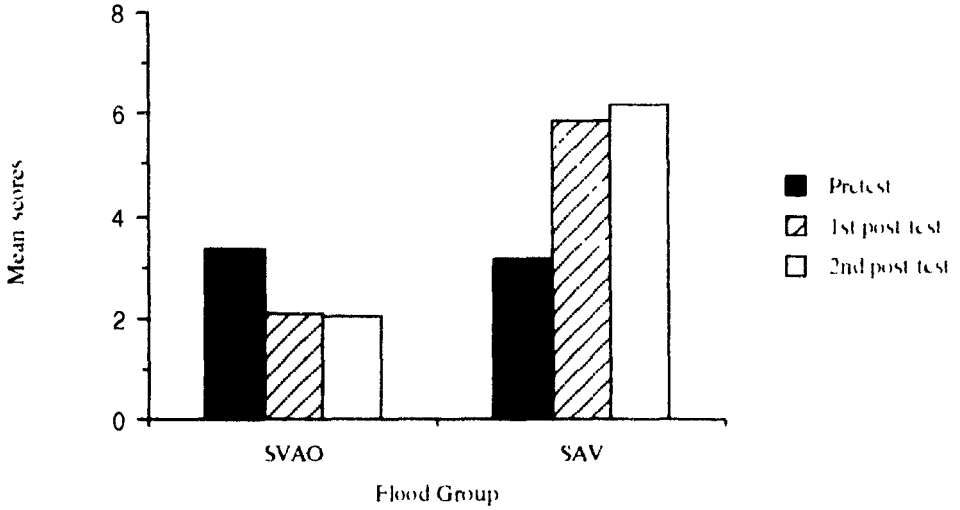
The question group was a grade 6 class. The two classes in the flood group, both grade 5 classes, did not differ significantly from each other on the MEQ test.

4.3.2 Grammaticality judgement task

The SVAO score on the grammaticality judgement task was calculated by adding the number of sentences which the subject changed to the ungrammatical SVAO order and the number of SVAO sentences in the text which the subject did not change. The maximum possible SVAO score is 16, as 16 sentences contained adverbs in the cartoon task, however, individual scores are generally below this since the adverb could be moved to several other positions as well as to the incorrect SVAO.

The second score calculated for each subject on this task was an SAV score, representing the number of sentences which the subject changed to SAV order plus the number of SAV sentences in the text which the subject left unchanged. Again, the maximum possible score is 16. The flood group's mean scores are presented in Figure 1.

**Figure 1** Grammaticality judgement task mean scores - flood group



On the pretest, the flood group achieves an average SVAO score of 3.37. This falls to 2.10 at the first post-test and stays at that level at the second post-test (average score 2.04). Analysis of variance (repeated measures) shows a significant effect for test session for the flood group scores ($F(2, 47) = 19.83$, $p = 0.0001$). Post-hoc Scheffé tests ($p < 0.05$) show that the drop in usage between pretest and first post-test is significant, while the slight decrease between the first and second post-tests is not.

The average SAV score for the flood group at the pretest is 3.15. This rises to 5.84 at the first post-test and 6.16 at the second post-test. ANOVA (repeated measures) shows a significant effect for test session for the flood group's scores ($F(2, 47) = 32.62$, $p = 0.0001$). Post-hoc Scheffé tests ($p < 0.05$) indicate that the increase from pre- to first post-test is significant, while the change from first to second post-test is not.

The results from the grammaticality judgement task indicate that exposure to the flood of input causes the subjects to learn that SAV is a possible order in English, as indicated by the significant increase in usage of SAV following the period of exposure. While the input flood does not teach learners that SVAO is ungrammatical in English (they still use SVAO following exposure), it does seem to affect their usage of this order on this task. In section 4.5.1, we will claim that this drop in SVAO errors is linked to the design of the task itself. The changes in usage of both the SAV and the SVAO orders on this task are maintained for at least three weeks following exposure to the flood of input.

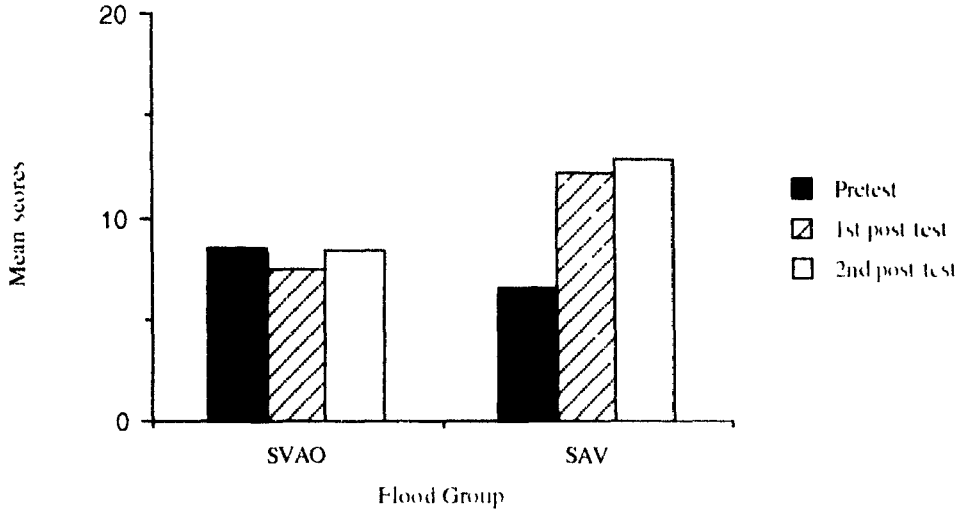
### 4.3.3 Preference task

The SVAO score for this task was determined by examining responses to pairs of sentences comparing an adverb in SVAO position with an adverb in any other position. The SVAO score represented the number of times the subject preferred the sentence containing the adverb in SVAO position or selected a "both right" response. The

maximum possible score on this task is 12, since twelve of the pairs of sentences contained one sentence in SVAO order.

The SAV scores for this task were determined by examining pairs of sentences comparing an adverb in SAV position with an adverb in another position. The SAV score was calculated by adding the number of times a subject preferred a sentence containing an adverb in SAV position or selected a "both right" response.[5] The maximum score on this task was 16, as there were 16 such pairs on the preference task. The flood group's mean scores are shown in Figure 2.

**Figure 2** Preference task mean scores - flood group




The flood group attains SVAO scores of 8.45 at the pretest. This falls to 7.44 at the first post-test and rises again to 8.31 at the second post-test. Analysis of variance (repeated

[5] It should be noted that the SAV score does not always indicate error-free usage. For example, selecting the SAV sentence as the only correct sentence would be an error if the other sentence was grammatical (i.e. in ASVO or SVOA order). Likewise, choosing a "both right" response would be an error if the other order was SVAO. Nonetheless, the SAV score on this task does provide an insight into whether or not the subjects have learned that SAV is possible, regardless of their treatment of the other orders.

measures) shows that there are no significant effects for test session ($F(2, 50) = 2.98$, $p = 0.06$).

At the pretest, the flood group attains a mean SAV score of 6.59. This jumps to 12.15 at the first post-test and increases again slightly to 12.83 at the second post-test. ANOVA (repeated measures) shows a significant effect for test session ($F(2, 50) = 84.14$, $p = 0.0001$). Post-hoc Scheffé tests ($p < 0.05$) show that the increase between pre- and first post-tests is significant, while the slight rise from first to second post-tests is not.

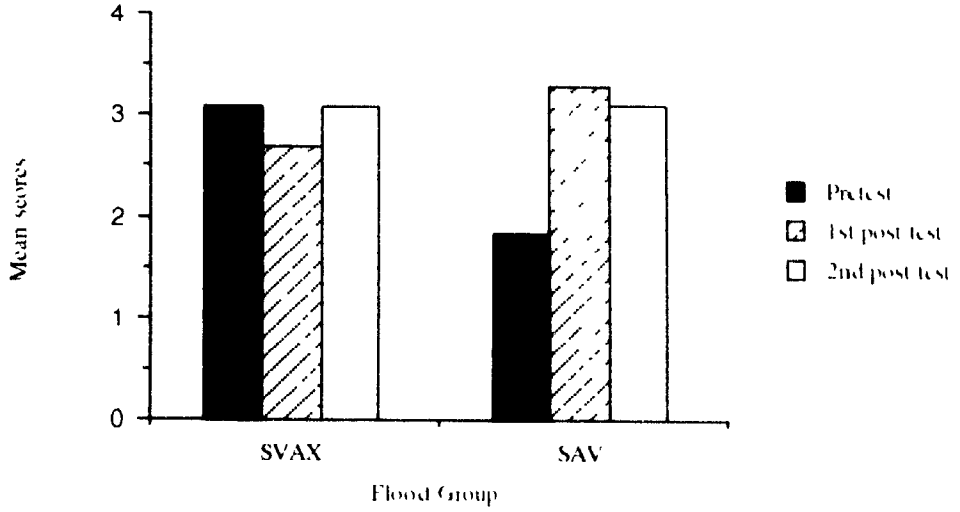
The results on the preference task indicate that exposure to the intensive input results in high levels of usage of SAV, while usage of SVAO is not significantly affected by the flood of input.

### 4.3.4 Sentence manipulation task

For this task, subjects received an SVAX score rather than an SVAO score since one of the four sentences they manipulated contained a PP instead of an Object. For that sentence SVAX would actually be a correct order. This score was calculated by adding the number of times the child laid out a sentence in SVAX order. The maximum possible score was 4, since each subject manipulated four sentences.

The SAV scores on this task represent the number of sentences the child laid out in SAV order. Again, the maximum possible score is 4. The mean scores for the flood group are represented in Figure 3.

**Figure 3** Sentence manipulation task mean scores - flood group




The mean SVAX score for the flood group stays near 3 across all sessions. The flood group scores 3.07 at the pretest. This drops slightly to 2.70 at the first post test and rises again to 3.10 at the second post-test. Post-hoc Scheffé procedures ($p < 0.05$) show that the changes from pre- to first post-test and from first to second post test are not significant.[6]

At the pretest, the flood group's SAV scores average 1.83. This rises to 3.28 at the first post-test and stays at that level (3.12) at the second post test. Analysis of variance (repeated measures) shows that there is a significant effect for test session for the flood group scores ($F(2, 50) = 30.13$, $p = 0.0001$). Post-hoc Scheffé tests ($p < 0.05$) show that the increase from pre- to first post-test is significant, however there is no significant change from first to second post-test.

Based on the assumption that the first order laid out in the manipulation task represents the subject's preferred response, the flood group's preferences were also examined. These are listed in Table 1 below.

[6] ANOVA (repeated measures) shows that there is a significant effect for session ($F(2, 50) = 3.68$, $p = 0.03$), however, the Scheffe tests do not indicate significant differences between the test sessions.

**Table 1** Manipulation task - first responses in percentages (total responses = 636)

| Responses | Pretest | 1st post-test | 2nd post-test |
|---|---|---|---|
| ASVX | 25.46 | 22.17 | 28.37 |
| SAVX | 11.11 | 33.96 | 29.33 |
| SVAX | 36.57 | 25.94 | 25.48 |
| SVXA | 25.46 | 16.51 | 16.83 |

At the pretest, SVAX is the preferred order, accounting for almost 37% of the responses. At the first post-test SAVX becomes the preferred order, making up 34% of the total responses. While the SAVX order is still preferred very slightly, the responses at the second post-test are distributed much more evenly. The SAVX order accounts for 29% and the SVAX 25% of the total responses at that time. It is noteworthy that usage of SVAX as the preferred order never drops below 25% at any of the sessions, indicating that the subjects have not learned that SVAX is ungrammatical in English.

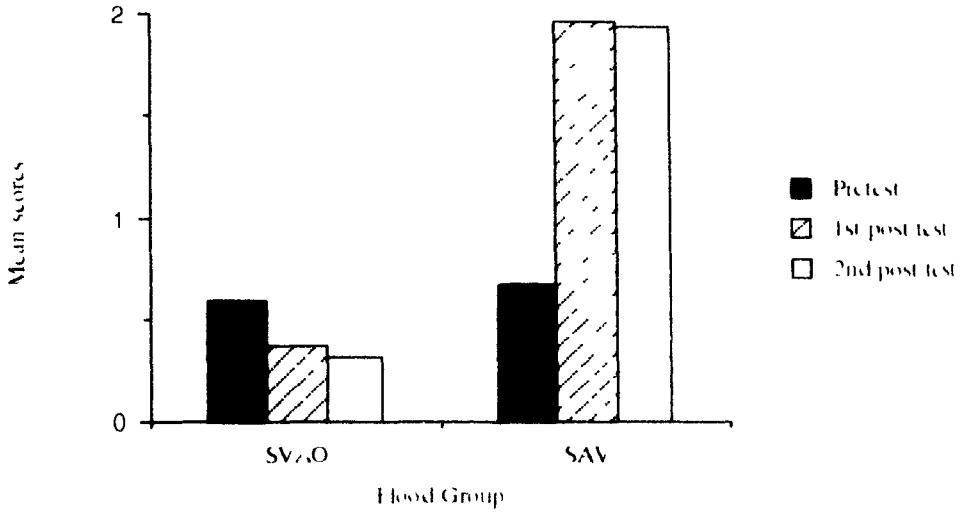
The results of the manipulation task again show that the input flood causes the subjects to learn that SAV is possible in English and does not permit them to learn that SVAO is ungrammatical. Analysis of preferred responses on this task indicates that the group's preference for SAV order increases after the input flood, but SVAX does not disappear from the learners' grammars - indeed it is preferred at least 25% of the time at all sessions.

4.3.5 Oral production task

The SVAO score for this task represented the number of times the child produced an SVAO sentence. The maximum possible score was 4, as each child had four pictures to describe. The SAV score on this task represents the number of sentences the child

produces in SAV order. Again, the maximum possible score is 4. Mean scores on this task are presented in Figure 4.

**Figure 4** Oral production task mean scores - flood group




At the pretest, the flood group attains mean SVAO scores of 0.59. This drops slightly at the first post-test to 0.36 and decreases further at the second post test to 0.31. Analysis of variance (repeated measures) shows that there is no significant effect for test sessions for the flood group scores ($F(2, 50) = 2.74$, $p = 0.07$), indicating that their usage of SVAO did not change following exposure.

At the pretest, the flood group achieves SAV scores of 0.67. At the first post test, this jumps to 1.96 and stays at that level at the second post-test (1.94). Analysis of variance (repeated measures) shows that the difference among test sessions is significant ($F(2, 50) = 25.32$, $p = 0.0001$). Post-hoc Scheffé procedures ($p < 0.05$) show that the increase from pretest to first post-test is significant while there is no significant change from first to second post-test.

According to the results of this task, exposure to a flood of adverbs in the input causes the usage of SAV to increase but does not cause the SVAO order to disappear. This increase in SAV scores is maintained three weeks following exposure. Of course, SVAO was not used very frequently even at the pretest. Below we examine the percentage of responses at each test session, which are listed in Table 2.

At the pretest, the initial and final positions are the most frequent - each accounting for approximately 30% of total responses. The sentence internal adverb positions each account for approximately 15% of the responses.[7] At the first and second post-tests, SAVO occurs most frequently, accounting for almost 50% of total responses. The SVAO and SVOA responses drop accordingly, while the adverb initial response remains close to 30% across all three sessions. These percentages differ from those observed for the sentence manipulation task, in which SVAO was preferred by all experimental groups at the pretest. This observation is discussed further below (section 4.5.3), where we will claim that this difference relates to the difficulty level of the oral production task.

**Table 2** Oral production task - responses in percentages (total responses = 636)

| Responses | Pretest | 1st post-test | 2nd post-test |
|---|---|---|---|
| ASVO | 31.48 | 26.89 | 31.73 |
| SAVO | 17.13 | 48.58 | 48.56 |
| SVAO | 13.89 | 8.96 | 7.69 |
| SVOA | 27.32 | 14.15 | 12.02 |

[7] The percentages do not add up to 100% on the pretest because some subjects produced ungrammatical sentences which could not be coded as one of the four orders discussed here.

4.3.6 Summary of results

In general then the flood group learned that SAV is a possible order in English. On all tasks, their usage of SAV increased significantly following the period of exposure and stayed high three weeks later. The flood of positive evidence did not permit subjects to learn that SVAO is not grammatical in English, as indicated by the fact that they still use SVAO following the period of exposure. There were decreases in usage of SVAO at the first post-test on all tasks. However, in two cases (the grammaticality judgement task and the oral production task) these effects can be linked to the design of the task (for discussion see section 4.5 below) and in the other two cases (the preference task and the sentence manipulation task) the effects are very weak - indeed they disappear just three weeks after the period of intensive exposure.

Of the subjects studied here, two appeared to have learned that SVAO is an impossible order in English following the input flood. These subjects started out using SVAO order at the pretest at approximately the average levels reported for the flood group. However, following the input flood each uses SVAO on only one task (the preference task) and at only one test session (one subject gets an SVAO score of 4 at the first post test and the other, a score of 1 at the second post-test). Generally, following the input flood these two subjects no longer use SVAO order. The usage of SAV order by one of these subjects also increases to extremely high levels (at or near the maximum possible SAV scores) following the input flood. This subject appears then to have reset the verb movement parameter. While the other subject's SAV scores also increase on all tasks,[8] her SAV scores on the post-tests do not approach the maximal scores, indicating that her grammar differs in some way from that of the native speaker in terms of the verb movement parameter. According

[8] On the cartoon task, her SAV scores increase by only 1 from the pretest to the post-tests.

to the information gathered on the background questionnaires, neither of these subjects was in any way exceptional in terms of their exposure to and usage of English.

Overall then, the group results reported above are indicative of the behaviour of individual subjects. Of the 54 studied here, only two differ from the group means in that they appear to have learned that SVAO is impossible, and only one appears to have actually reset the verb movement parameter.

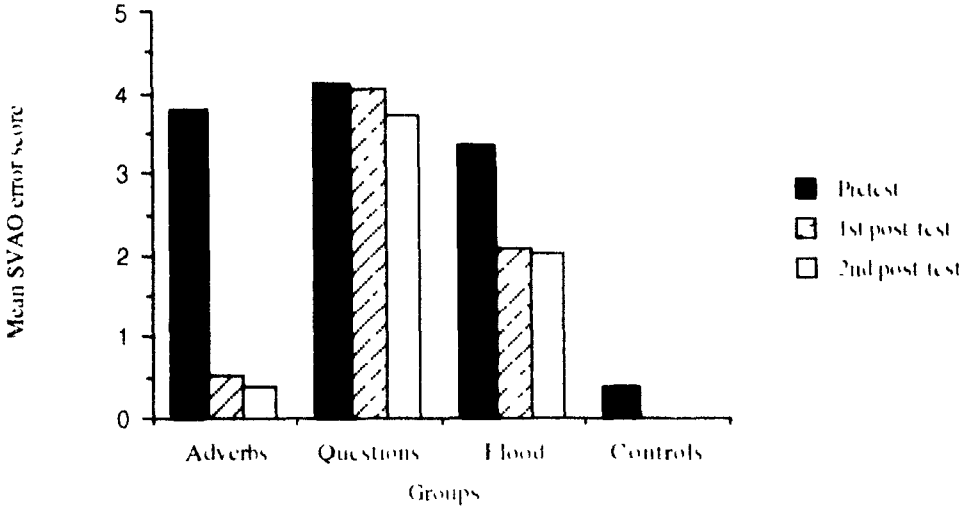
### 4.4 Comparison with other experimental groups

In this section, the results of the flood group discussed above will be compared to those of the two experimental groups (the adverb group and the question group) of the White (1991a) study. Overall, the flood group behaves like the adverb group as regards the usage of SAV and like the question group on SVAO orders.

#### 4.4.1 Grammaticality judgement task

At the pretest, all experimental groups attained SVAO scores between 3 and 4. The native speaker controls almost never produce the SVAO order (average score 0.40). The adverb group's error scores drop to native speaker levels at the first post-test (average score 0.5) and stay at this level at the second post-test (0.38). The question group's scores, on the other hand, do not change, but remain at approximately 4 at all three test sessions. The flood group's usage of SVAO order drops from the pretest to the first post-test. There is no change from the first to second post-tests. Figure 5 shows the mean SVAO scores for all groups.

**Figure 5** Grammaticality judgement task mean SVAO error scores - all groups

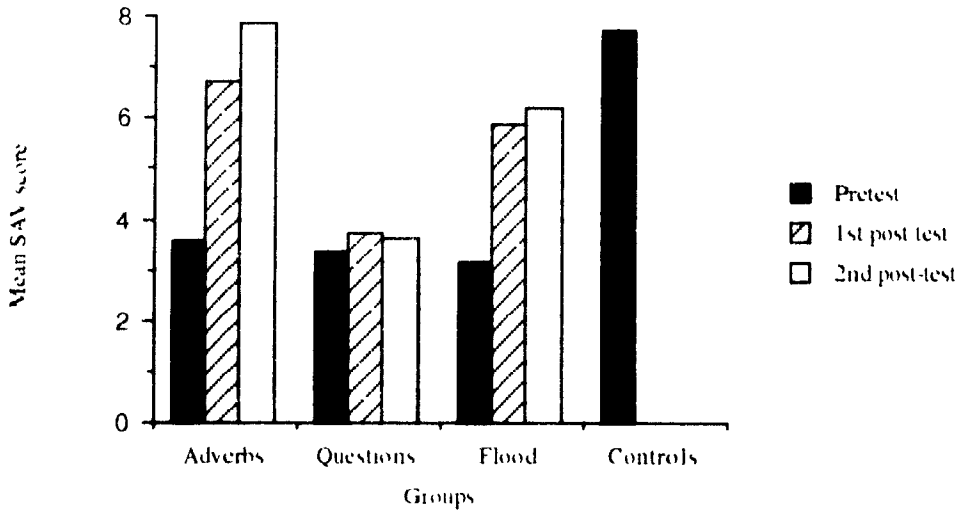



Analysis of variance (repeated measures) shows that differences between the groups ($F(2, 120) = 39.21$, $p = 0.0001$), the test sessions ($F(2, 120) = 68.17$, $p = 0.0001$) and the interaction between group and session ($F(4, 120) = 19.84$, $p = 0.0001$) are all significant. Post-hoc Scheffé tests ($p < 0.05$) show that the flood group does not differ significantly from the question group (average score 4.13) or the adverb group (average score 3.8) at the pretest. All groups score significantly above the control group (average score 0.4) at this time. At the first and second post-tests, the flood group differs significantly from all the other groups, making significantly more SVAO errors than the controls and the adverb group, but significantly fewer than the question group

The SAV scores for the three experimental groups are also similar (between 3 and 3.5) at the pretest. The control group attains mean scores of 7.68 on this order At the first post-test, the adverb group's usage of SAV rises to 6.68 and increases again slightly between the first and second post-tests (to 7.8). The question group's usage of SAV stays approximately the same across the sessions (around 3.5). The flood group's scores jump

to nearly 6 at the first post-test and rise again slightly at the second post-test (6.25). The SAV scores for all groups at all sessions are shown in Figure 6.

**Figure 6** Grammaticality judgement task mean SAV scores - all groups



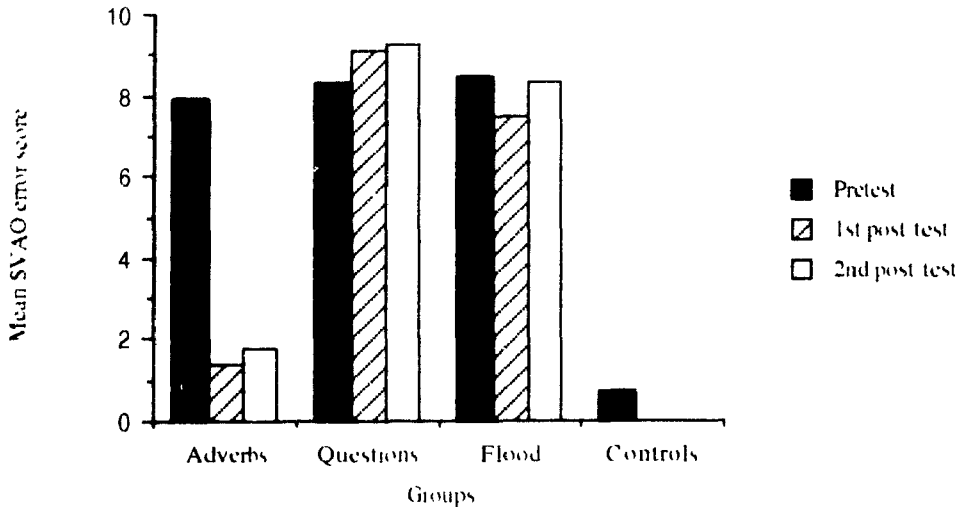

Analysis of variance (repeated measures) shows that differences for groups ($F(2, 120) = 14.33$, $p = 0.0001$), sessions ($F(2, 120) = 51.54$, $p = 0.0001$) and interaction between group and session ($F(4, 120) = 9.54$, $p = 0.0001$) are highly significant. Post-hoc Scheffé procedures ($p < 0.05$) show that at the pretest, the flood group does not differ significantly from the other experimental groups but scores significantly lower than the native speaker controls. At the first post-test, the flood group does not differ significantly from the adverb group but achieves significantly lower SAV scores than the control group and significantly higher scores than the question group. At the second post-test, the flood group's scores rise again slightly. The score at this session is not significantly different from that of the adverb group or the controls. Again, the flood group uses SAV significantly more often than the question group at the second post-test.

As far as the SVAO order is concerned, these results indicate that, in contrast to the form focussed instruction and negative evidence received by the adverb group, the input flood does not make the subjects realize that SVAO is not a possible order in English. Nevertheless, exposure to positive evidence does affect the subjects' usage of SVAO order on this task, since they do behave differently from the group who received no modified input (the question group). The input flood appears to be as effective as explicit positive and negative evidence in permitting the subjects to learn that SAV is a possible word order in English. The flood group does not differ significantly from the adverb group on the post-tests.

### 4.4.2 Preference task

At the pretest, all three experimental groups achieve mean SVAO scores of around 8 on the preference task. As on the grammaticality judgement task, the controls almost never accept the SVAO order on this task, attaining an average score of approximately 0.7. The adverb group's acceptance of SVAO, on the other hand, drops dramatically after instruction to scores of approximately 1.5. The question group's acceptance of SVAO increases slightly to scores of about 9 at the post-tests. The flood group's scores decrease slightly to approximately 7.5 at the first post-test and go back up to 8.3 at the second post test. These scores are presented in Figure 7.

**Figure 7** Preference task mean SVAO error scores - all groups

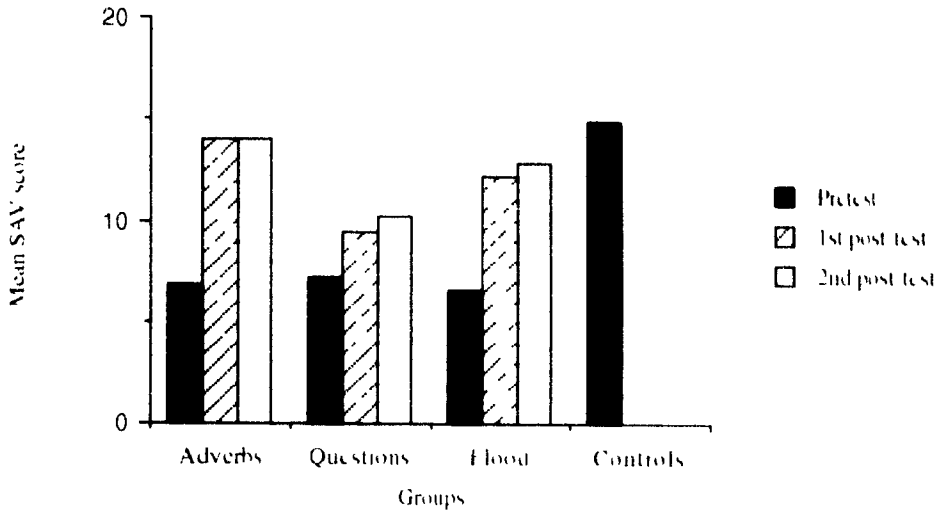



Analysis of variance (repeated measures) shows highly significant differences among experimental groups ($F(2, 162) = 138.4$, $p = 0.0001$), test session ($F(2, 162) = 72.8$, $p = 0.0001$) and a highly significant interaction between groups and test sessions ($F(4, 162) = 56$, $p = 0.0001$). Post-hoc Scheffé procedures ($p < 0.05$) show that at the pretest, the flood group does not behave significantly differently from the other experimental groups, but does score significantly above the control group. At the first and second post-tests the flood group makes significantly more SVAO errors than the control group and the adverb group. The flood group scores significantly lower than the question group on the first post-test, but this difference becomes non-significant at the second post-test.

All three experimental groups have SAV scores of around 7 at the pretest. The control group scores on average 15 on this task. The adverb group's scores increase from 7 to 14 at the first post-test and stay high at the second post-test. The questions group's acceptance of SAV also increases at the first post-test to a mean of 9.4 and increases again to 10 at the second post-test. The flood group's scores jump to 12 at the first post-test and increase

again slightly (to 12.83) at the second post-test. Figure 8 shows the SAV scores for all groups.

**Figure 8** Preference task mean SAV scores - all groups




Analysis of variance (repeated measures) shows that the differences between groups ($F(2, 162) = 12.9$, $p = 0.0001$), and test sessions ($F(2, 162) = 225.7$, $p = 0.0001$) are significant, as is the interaction between groups and test sessions ($F(4, 162) = 13.58$, $p = 0.0001$). Post-hoc Scheffé tests ($p < 0.05$) show that the flood group does not behave significantly differently from the adverb and question groups at the pretest. They do score significantly below the controls. At the first post-test, the flood group scores significantly lower than the adverb group and the control group. At the second post test, these differences become non-significant. At both sessions, the flood group scores significantly higher than the question group.

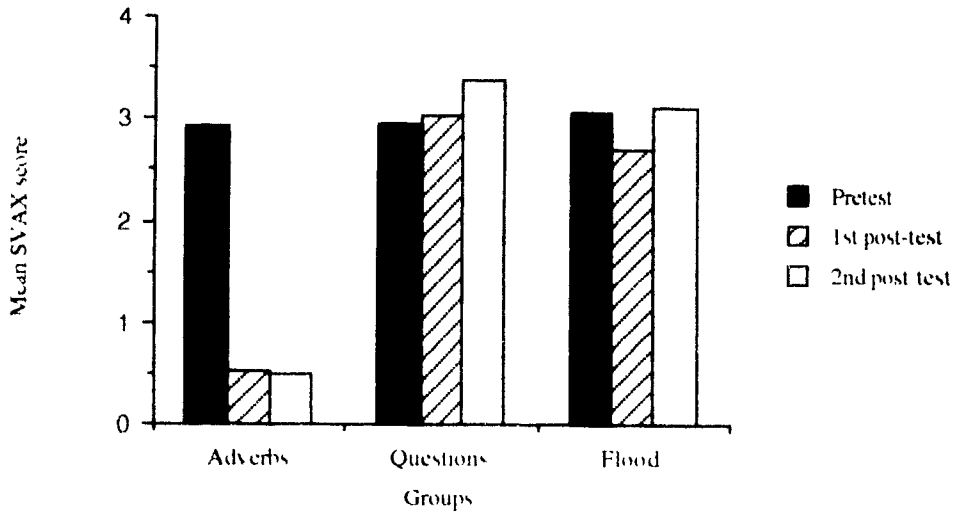
To summarize, these results indicate once again that the input flood, unlike instruction, does not teach learners that SVAO is not possible in English. The flood group performs at or only slightly better than the levels of the group who had received no modified input at

all. However, the input flood results in an increase in usage of SAV order which reaches or is only slightly lower than the levels of the instructed group and the controls.

4.4.3 Sentence manipulation task

On pretesting, the experimental groups attain SVAX scores of approximately 3 on the sentence manipulation task. The control group only manipulated three of the test sentences - all of which were SVO sentences. On those, they never lay out a sentence in SVAX order. The flood group's scores remain around 3 across the sessions, as do those of the question group. The adverb group, on the other hand, produces SVAX far less at the post-tests, dropping to a mean score of 0.5. These scores (except the controls whose mean score was 0) are presented in figure 9.

**Figure 9** Sentence manipulation task mean SVAX scores - all groups

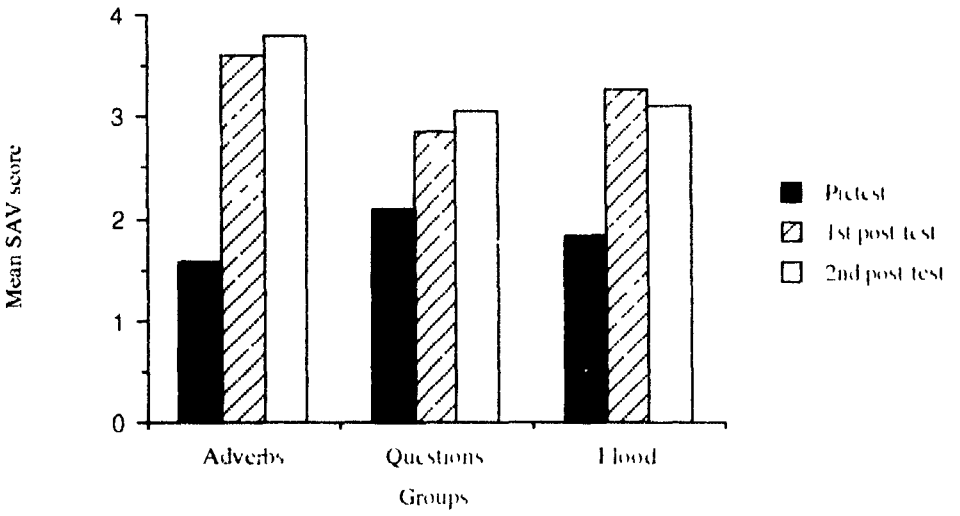



Analysis of variance (repeated measures) shows that the differences between flood, adverb and question group ($F(2, 163) = 107.4$, $p = 0.0001$) and test sessions ($F(2, 163) =$

69.22, p = 0.0001) are highly significant, as is the interaction between groups and test sessions (F(4, 163) = 45.98, p = 0.0001). Post-hoc Scheffé procedures ($p < 0.05$) show that the experimental groups do not differ significantly at the pretest. At both the first and second post-tests, the flood group makes significantly more SVAO errors than the adverb group, but does not differ significantly from the question group.

At the pretest, the mean SAV scores on this task are between 1.5 and 2 for all experimental groups. The mean scores of all groups increase at the post test. The flood group's scores jump to over 3 at the first post-test and stay high at the second post-test. The adverb group's scores increase to over 3.5 at the post-tests and the question group attains scores of around 3 at both post-tests. These scores are depicted in Figure 10.

**Figure 10** Sentence manipulation task mean SAV scores - all groups




Analysis of variance (repeated measures) shows that the differences among adverb, question and flood groups (F(2, 163) = 3.94, p = 0.02) and among test sessions (F(2, 163) = 140.5, p = 0.0001) as well as the interaction for groups and sessions (F(4, 163) = 7.54, p = 0.0001) are all significant. Post-hoc Scheffé procedures ($p < 0.05$) show that

the groups do not differ significantly at the pretest. Likewise, at the first post-test the flood group does not differ significantly from either the adverb group or the question group. At the second post test, the flood group uses SAV significantly less often than the adverb group, but does not differ significantly from the question group

Table 3 shows that the first responses on this task also indicate differences in preferences among the groups The flood group does not seem to have as strong a preference for SVAX at the pretest as the other experimental groups, for which SVAX accounts for almost half the responses. Also, the flood group's preferences for SAVX at the first post-test (34%) are not quite as strong as the adverb group's (41% of responses) and are only slightly stronger than the question group's (23% of responses) At the second post-test, the flood group's preference for SAVX (29%) is not as strong as that of the adverb group, where it accounts for almost half the first responses. The question group has a stronger preference for SVAX (44%) and a weaker preference for SAVX (17%) than the flood group at this time

Exposure to the input flood, then, appears to show learners that SAV is a possible order; however, the flood group's preferences for SAV order are weaker and not as long lasting as those of the instructed group. They are, nevertheless, stronger than those of the group who received no modified input. Similarly, the flood group prefers the SVAX order less often than the question group at the post-tests, but, unlike the adverb group who prefer SVAX less than 5% of the time, the order is still preferred by the flood group 25% of the time after the period of the input flood.

**Table 3** Manipulation task - first responses in percentages (total responses approx 2382)

| | Pretest | | 1st post test | | | 2nd post-test | | | |
|---|---|---|---|---|---|---|---|---|---|
| Response | Flood | Adv&Ques | Flood | Adv | Ques | Flood | Adv | Ques | Control |
| ASVX | 25.46 | 13.66 | 22.2 | 42.5 | 20.2 | 28.4 | 37.1 | 20.8 | 10.2 |
| SAVX | 11.11 | 11.18 | 34.0 | 40.6 | 22.5 | 29.3 | 48.5 | 17.4 | 55.1 |
| SVAX | 36.57 | 49.07 | 25.9 | 4.2 | 38.0 | 25.5 | 2.9 | 44.0 | 0.00 |
| SVXA | 25.46 | 26.09 | 16.5 | 12.7 | 19.3 | 16.8 | 11.4 | 17.9 | 34.7 |

The results of the manipulation task show that the flood group, like the question group, has not learned that SVAO is impossible. Only the adverb group stops using SVAO at the first post-test. Exposure does cause the learners to use SAV at levels like the adverb group, however, the group who received no modified input also attained high SAV scores. What these results show, in fact, is that the question group and the flood group are laying out both orders for most of the sentences they manipulate, indicating that the exposure has not caused a change in the learner's usage of SVAO on this task.

4.4.4 Summary of results

These results indicate that even at the pretest subjects appear to be using both SAV and SVAO orders to some degree. Exposure to the flood of positive evidence causes the subjects to increase their usage of SAV order, as indicated by the significant gains in SAV scores on all tasks from pretest to first post-test. At the post tests, the flood group uses SAV at or near the levels attained by the instructed adverb group and higher than the uninstructed question group.[9] Exposure to the input flood did not cause the learners to realize that SVAO is an impossible word order in English, as indicated by their continued

[9] On the manipulation task, this result is not as clear, since all groups achieve high scores on SAV

usage of SVAO after the period of exposure. The flood group's SVAO scores are always significantly higher than those of the adverb group and near or slightly lower than those of the uninstructed question group. The flood group appears, then, to be using both SAV and SVAO orders after the period of exposure, and the input flood appears to have been little more effective than no modified input at helping the subjects learn that SVAO is impossible in English. Nonetheless, there were slight decreases in SVAO scores at the first post-test on all tasks. In two cases (the sentence manipulation task and the preference task), the decline was short lived. Indeed, it had disappeared just three weeks after the period of exposure. On the other tasks (the grammaticality judgement task and the oral production task), the decrease in SVAO scores can be linked to the design of the task - namely that a preference for SAV order following the input flood resulted in a corresponding decline in usage of SVAO. Below, we take a closer look at the flood group's preferences and how these might affect their behaviour on certain of the tasks.

### 4.5 Changes in competence versus changes in preferences

We begin by discussing the results of the grammaticality judgement task (the only task on which the drop in SVAO scores between pretest and first post-test reached significance) and showing how the interpretation suggested above is supported by results indicating a shift in learners' preferences following the input flood, as measured on the sentence manipulation task.

#### 4.5.1 Grammaticality judgement task

Recall that the grammaticality judgement task was a written task in the form of a cartoon story. Of the 33 sentences in the story, 16 contained adverbs, some of which appeared in incorrect SVAO position. The subjects had to correct the sentences they considered

ungrammatical by drawing an arrow from the misplaced word to its proper position. It seems likely, however, that the subjects did not complete this task exactly as intended - for example, they may not have "fixed" only the sentences they considered ungrammatical, but also sentences in which the adverb was not in their preferred order. In other words, in addition to moving adverbs from ungrammatical positions, they may have moved adverbs from positions they considered grammatical but which were not the "preferred" position. Support for this interpretation comes from the patterns of usage of SAV and SVAO orders on the grammaticality judgement task itself, as well as a shift in preferences found on the sentence manipulation task.

Briefly, the flood group's SVAO scores fell significantly from pretest (3.37) to first post-test (2.10) on the grammaticality judgement task and stayed approximately the same at the second post-test (2.04). Their SAV score was 3.15 at the pretest. This jumped to 5.84 at the first post-test and stayed around 6 at the second post test. In general, scores for sentence internal adverb positions totalled 6.52 at the pretest (SAV and SVAO scores combined). In other words, about 40% of the adverbs were moved to or left in sentence internal position at that session. At the post-tests, usage of sentence internal adverbs increased slightly to a total of about 8 - that is, about half of the adverbs in the text were accepted or placed by the subjects in sentence internal positions. At the pretest, SVAO and SAV orders each account for about 50% of the adverbs that appear in sentence internal positions (51.2 and 48.3% respectively). At the first post test, however, these percentages change to 26.5 for SVAO and 73.6 for SAV. What is noteworthy here, is that the SVAO order has *not* disappeared on this task - there has merely been a decline in its usage. Because the SVAO order does not disappear, I think that these results reveal not that SVAO is being "unlearned" by these subjects, but rather that an increased preference for SAV order after exposure to the input flood has resulted in a corresponding decline in SVAO usage on this task. There are a fixed number of sentences in this task, and hence, a fixed number of changes to be made. Therefore, an increase in usage of one order must

necessarily result in the decline of another order. It seems likely, then, that the decrease in the SVAO order (without its actual disappearance) results from a heightened preference for SAV after the input flood, rather than an actual rejection of SVAO. This interpretation is supported by the subjects' behaviour on the sentence manipulation task - a task which may provide clearer insights into the learners' preferences.

4.5.2 Sentence manipulation task

The sentence manipulation task was an individual test in which subjects had to form as many sentences as possible (containing an adverb) with a single set of word cards. This task was specially designed to provide information not only on preferences, but by forcing the child to lay out all possible orders, on implicit judgements of grammaticality as well. Based on the assumption that the first order laid out by the child corresponds to their preferred order, percentages of first responses were calculated for the flood group. Table 1, which lists first responses in percentages, is repeated below.

**Table 1** Manipulation task - first responses in percentages (total responses = 636)

| Responses | Pretest | 1st post-test | 2nd post-test |
|---|---|---|---|
| ASVX | 25.46 | 22.17 | 28.37 |
| SAVX | 11.11 | 33.96 | 29.33 |
| SVAX | 36.57 | 25.94 | 25.48 |
| SVXA | 25.46 | 16.51 | 16.83 |

As these percentages indicate, SVAX is the preferred order at the pretest, making up almost 37% of responses. SAV order accounts for only 11% of the first responses at this

time.[10] At the post tests, preferences for SVAX fall to 25%, while the SAV order rises to around 30% What is noteworthy here is that usage of SAV as the first response increases following the period of intensive exposure. Based on our assumptions, then, there is an increase in preferences for the SAV order after the input flood

These results support the interpretation proposed above for the grammaticality judgement task. The manipulation task seems to indicate that SAV is slightly preferred after the input flood [11] SVAX, however, does not disappear in fact, it is still preferred over 25% of the time at both post-tests. These results suggest then that the grammaticality judgement task may indeed be reflecting preferences rather than judgements of grammaticality. If, in completing the grammaticality judgement task, subjects changed not only ungrammatical but also grammatical but "non preferred" adverb positions, the significant decline in usage of SVAO order can be related not to a rejection of SVAO, but rather to a preference for SAV

4.5.3 Oral production task

The same interpretation can be applied to the oral production task, on which the drop in SVAO scores was not significant. Recall that on the oral production task, subjects were shown a picture on which was printed an adverb They had to make up a sentence, containing the given word, to describe the picture In total each subject produced four sentences, since each had four pictures to describe. Here, the decrease in SVAO scores can be linked to the design of the task, in much the same way as on the grammaticality judgement task. Once again, the subjects' preferences for SAV order appeared to increase following the input flood. Since the total number of sentences was fixed on this task, an

[10] These percentages are not strictly comparable with those on the grammaticality judgement task since here four orders are being included in the calculations while for the grammaticality judgement task only the sentence internal (SAV and SVAO) orders were taken into consideration

[11] At the first post test SAV is preferred more often than any other order, although this effect seems to disappear by the second post-test

increase in the usage of one order must result in the corresponding decrease of another. Here then, higher SAV scores on the post-tests would automatically result in the decline of scores for the other orders. Indeed, as Table 2 (repeated below) shows, usage of all orders other than SAV declined following the input flood,[12] while usage of SAV order jumps from under 20% to nearly 50%. Again, it appears that this behaviour may be reflecting preferences rather than judgements of grammaticality.

If this is the case, however - that is, if the responses on the oral production task are reflecting the children's preferences - then there is a striking discrepancy between the responses on the oral production task and the first responses on the sentence manipulation task on the pretest - on the oral production task, the children do not seem to prefer SVAO at that session. A possible explanation for this discrepancy, related to the difficulty level of the oral production task, is proposed below.

**Table 2** Oral production task - responses in percentages (total responses = 636)

| Responses | Pretest | 1st post-test | 2nd post-test |
|---|---|---|---|
| ASVO | 31.48 | 26.89 | 31.73 |
| SAVO | 17.13 | 48.58 | 48.56 |
| SVAO | 13.89 | 8.96 | 7.69 |
| SVOA | 27.32 | 14.13 | 12.02 |

As Tables 1 and 2 show, there are considerably fewer SVAO orders produced on the oral production task at the pretest than on the sentence manipulation task. Unlike the manipulation task, the preferred order on the oral task at the pretest is ASVO, with the adverb in initial position. This is closely followed by SVOA order, in which the adverb appears sentence finally. The sentence internal positions account for less than a third of the

[12] The decrease in ASVO order is weaker than the other orders and disappears by the second post-test.

total responses (31%) at the pretest, while the peripheral adverb positions account for over half (59%).

As mentioned above (see section 4.2.4.4), it was expected that the subjects would have difficulty with this task at the pretest. There were several reasons for this. Firstly, the subjects had not been taught adverbs in the classroom, therefore unfamiliarity with the vocabulary could cause potential problems. Secondly, unlike the others, this task involved the creative production of a sentence by the subject. Therefore, the children were expected to find this task difficult, in that they would have to supply the words as well as position the adverb. Thirdly, being an oral task, the "pressure to perform" would likely be greater on this task than on the others - a characteristic aggravated for some students by the fact that they were being taped.

All these factors were expected to increase the likelihood that students may have difficulty with this task. In fact, we were expecting that at least some students would not be able to do the task at all before they had learned the adverb vocabulary in the classroom. Indeed, some of the children had great difficulty at the pretest, as evidenced by false starts, hesitations, repetitions and ungrammatical utterances. Overall however, most subjects seemed capable of at least attempting a descriptive sentence. The difficulty we were expecting at the pretest manifested itself in another way - namely, the way the children went about constructing their sentences.

The learners appear to be treating the task involved in this activity as two distinct steps: first, creating a sentence to describe the picture and second, placing the adverb. Subjects who completed step one before step two ended up with the order SVOA, where they first construct a sentence for the picture and then add the written word onto their sentence. Subjects who completed the steps in the reverse order dealt with the written word first and then created the sentence, resulting in the ASVO order. There was less of an effort at the pretest to actually incorporate the word into the sentence, perhaps because the task was already fairly complex for these learners. This strategy explains why the percentages of

peripheral (ASVO/SVOA) orders are rather high on this task at this session. Similarly, it accounts for why the learners don't start off preferring SVAO (i.e the I 1 parameter setting) on this task. Once the learners are introduced to the adverbs in the classroom, this discrepancy between the oral production and the sentence manipulation tasks disappears, with the students preferring SAV order on both.[13]

## 4.6 Conclusion

In sum, these results have shown that the flood group increased their usage of and preference for the SAV order after the input flood, but did not expunge the SVAO order from their II . In the next chapter, we will consider the state of the learners' grammars in more detail and we will discuss the implications of these results for the issues discussed in the previous chapters, particularly, the role of preemption in parameter setting in SLA.

[13] It is not clear to me why preferences for SVAO on the oral production task are lower than on the sentence manipulation task at the post-tests.

# Chapter 5 Discussion

The results presented in Chapter 4 suggest that the flood group did not reset the verb movement parameter to the English value. In terms of the research question posed in section 3.6 (namely, will positive evidence alone be sufficient to preempt the L1 value of the verb movement parameter?), these results suggest that, in this case, positive evidence was not sufficient to cause preemption of the L1 parameter setting. In this chapter, we consider possible reasons for the failure of positive evidence in this case.

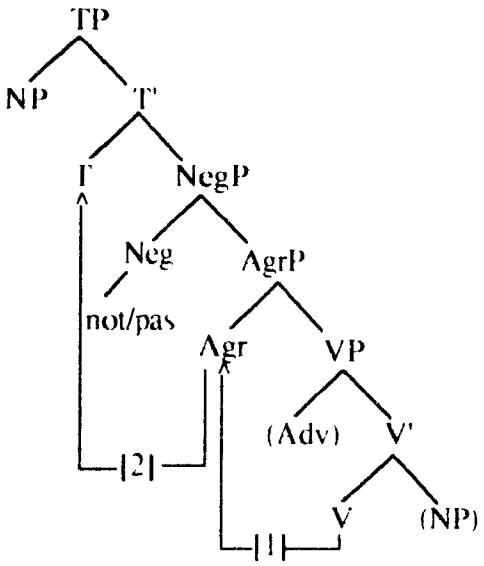
## 5.1 The learner's grammar

In considering the implications of these results, the first question which must be addressed concerns the nature of the learners' grammars after the input flood: syntactically, how are adverbs being treated in the learners' grammars? Their acceptance of both SAV and SVAO orders, can be explained in two ways. Firstly, the subjects may be assuming that verb raising is optional in English. Secondly, the subjects may have acquired a new position for base generating adverbs. These possibilities are developed below.

### 5.1.1 Optional verb movement

The first possible analysis is that verb movement is optional in the learner's grammar. This is represented in (1).

(1)




According to this analysis, English finite verbs are acting in the learner's IL like non-finite English auxiliaries or nonfinite verbs in French, which may either move out of the VP to surface in pre-adverbial position or remain in the VP where they appear after the adverb. That is, the movement depicted by arrows [1] and [2] above is considered a purely optional movement [1] How, then, must the learners be treating the verb movement parameter? That is if movement is optional, allowing the child to produce both SVAO and SAV in a single grammar, what value of the parameter must the child have adopted?

It is quite clear that if the child accepts the movement of finite verbs as optional,[2] he or she has not adopted a single setting of the verb movement parameter. Rather, the subjects appear to be using both values In order to produce SVAO order the child must be assuming that AGR is transparent, and hence, that lexical verbs can assign their theta roles from within AGR (since otherwise the verb could not raise). The flood group must then be adopting this value of the parameter since they produce sentences in SVAO order. On the other hand, to generate the SAV order, the child must be assuming that AGR is opaque and

[1] Again, whether the verb is moving through AGR to Tense (arrows [1] and [2]) or just to AGR (arrow [1]) is not crucial here Once the verb leaves its VP, it will surface before the adverb, resulting in the SVAO order which is of interest here

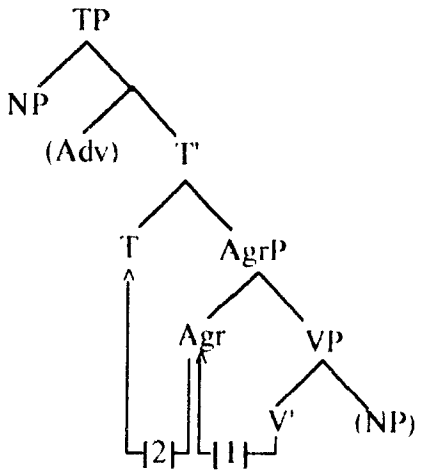
[2] For independent reasons, the movement of nonfinite lexical verbs to AGR is optional in French.

hence that lexical verbs cannot assign their theta roles from within AGR (since otherwise finite verb raising would be obligatory as in French). The flood group must also be adopting this value of the parameter since they produce SAV sentences as well. The child must be adopting the English parameter value in producing SAV order and the French in producing SVAO order. Therefore, if the child thinks that finite verb movement is optional, then both parameter settings must be activated in his or her grammar and preemption is quite clearly not operating. Before discussing the implications of this, we turn to a second possible syntactic representation in the child's grammar.

5.1.2 Pre-INFL adverb position

There is another possible position for base generating adverbs in English between the subject and INFL (Pollock 1989: 370, White 1991b: 357), represented in (2) below.

(2)




This pre-INFL adverb position is not available in French. Therefore, the SAV sentences the children produce could have the underlying representation in (2), where the pre-verbal adverb is generated, not VP-initially, but rather in the pre-INFL adverb position.

Here, the surface order would still be SAVO despite the fact that verb raising has actually occurred - that is, if the adverb is being base generated in the position between NP and T in (2), verb raising (depicted by arrows [1] and [2] in (2)) could take place and the adverb would still surface pre-verbally in the sentence. Learners may be generating SAV order by base generating the adverb in the pre-INFL position and raising the finite verb and generating SVAO order by generating the adverb in the VP-initial adverb position and raising the verb out of the VP and across that position. Our subjects may be generating both orders, then, by retaining the L1 parameter setting, but by adding an extra underlying adverb position in English.

Two types of data could distinguish whether this representation is appropriate for these subjects. Firstly, if the adverb is generated in the pre-INFL position, then it should surface before elements, like modals, considered to be generated under the Tense node (Pollock 1989, 398). Therefore, sentences like those in (3) would be evidence that the adverb appears in pre-INFL (pre-Tense in Pollock's terms) position.

(3) Children often can't sleep on Christmas Eve.

Unfortunately, such data are not available from these subjects since such sentences were not included in the tests and none were produced by the subjects during the oral production task.

A second way to distinguish whether a pre-INFL adverb position is available is through the production of sentences of the form SAVAO, where the verb has quite clearly raised over the second adverb as in French, yet there is still an adverb immediately following the subject of the sentence. One subject does produce this order on the oral production task at the first post-test with the sentence "My dad and me always wash carefully the car." This sentence indeed seems to indicate that the pre-INFL position is available for this subject; however, since this order was produced by only one subject on only one sentence at only

one test session, it is unclear whether this subject's behaviour is representative of the other subjects in the flood group. Only further testing for judgements of grammaticality on sentences of this kind, plus sentences like those in (3) could clarify the issue

If the pre-INFL analysis is correct, then these results tell us nothing about parameter setting in L2 acquisition, except that resetting was not triggered by the type of input these subjects received. Below we will consider several possible reasons why this input may not have been sufficient

In both of the possible analyses presented above, the learners appear to have combined elements from the L1 and the L2 grammars. In the first case, they have adopted both the L1 and L2 settings for a single parameter and in the second, they have retained the L1 setting but added an L2 position to the underlying representation In both cases, some factor has prevented parameter resetting from taking place. We turn now to a consideration of why parameter resetting did not operate properly in this case.

## 5.2 Implications

Assuming the first interpretation mentioned above - namely, that movement is optional and hence two parameter settings are being held at once - there are several possible reasons why the parameter was not reset. Firstly, preemption may not operate for parameter setting in L2 acquisition. Perhaps, as discussed in section 3.3.1, knowledge of a L1 somehow affects the application of the Uniqueness Principle resulting, for example, in the acceptance of more than one syntactic representation for a single meaning In particular, perhaps Berwick's formulation of Uniqueness no longer applies and therefore two parameter settings can be held at a time This interpretation is supported somewhat by other studies which suggest that the Subset Principle (another learning principle contained, like Uniqueness, in the partially independent "learning module") also malfunctions in SLA (Zobl 1988, White 1989b). It is also possible that, if preemption is inoperative, the failure

of parameter resetting here is linked to the nature of the input provided. White (1991a) has shown that learners who received negative and explicit positive evidence on the impossibility of SVAO as a word order in English rejected that order following instruction.[3] The input to which the flood group was exposed consisted solely of relatively naturalistic sentences containing adverbs including positive evidence on the grammaticality of the SAV order in English. Perhaps, if preemption is not functioning in L2 as in L1 acquisition, negative evidence is required to trigger parameter resetting in SLA, in cases where the IL contains incorrect structures generated through L1 processes (i.e. SVAO order) which are non-occurring in the L2. It should be pointed out here that failure of the learning principles, i.e. Uniqueness, does not suggest inaccessibility of UG, since parameter resetting may eventually be possible even without the constraints of the learning principles, although the process will surely not be as efficient as in L1 acquisition.

A second related possibility is that preemption is operative, but that there is a period in acquisition during which two parameter settings may be held in a single grammar. Berwick for example, refers briefly to the possibility that in the face of "confusing" input data (i.e. topicalized structures in the setting of the head-complement parameter in English) two settings may be maintained while a choice is being made. He states: "When conflicting values arise, the acquisition procedure appeals to the most frequently successful parameter setting. In effect, the system will carry along a dual grammar until one version or another wins out" (Berwick 1985: 184). Recently, a similar proposal has been put forth by Valian (1990). Here, in the setting of the prodrop parameter, the child is considered to have access to both values of the parameter until one setting wins out on the basis of the distributional evidence in the input the child hears.[4]

[3] That these results actually represent changes in the learners' linguistic competence has been challenged by Schwartz and Gubala-Ryzak (1992) This claim is discussed briefly below

[4] For a related, but different, proposal concerning L2 acquisition see Cook (1991)

Thirdly, resetting may not have worked here because parameters of UG are no longer operating in L2 acquisition. These results have not shown, however, that resetting is impossible, merely that it was not achieved on the basis of the input provided to these subjects. Other studies indicating eventual parameter resetting do not support this interpretation (Hilles 1986, White 1988).

Finally, it has been claimed (Iatridou 1990) that adverb placement actually does not fall under the domain of the verb movement parameter. Rather, patterns of adverb placement are linked to the positions available for base generation and to the compatibility of adverbs and other elements as members of a single constituent. Of course, if this is the case, parameter resetting has failed because the structure investigated is not associated with a parameter in the first place.

If the second syntactic interpretation proposed above is correct - namely, that the subjects have retained the L1 value of the parameter but have learned that English has an additional pre-INFL position for the base generation of adverbs - then, these results have told us nothing about parameter resetting except that the input provided to the flood group did not trigger it. It is worth considering why this might be the case.

Schwartz and Gubala-Ryzak (1992) claim that the type of input provided in the original study (White 1991a) did not and in fact cannot be used by the language faculty, since the type of knowledge which results from negative and explicit positive evidence cannot be accessed by the grammar building mechanisms. According to Schwartz and Gubala-Ryzak, only primary linguistic data - that is, sentences in the input - are accessible to UG. The input provided to the flood group in the present study consisted of mere exposure to the language without negative evidence or instruction. Nonetheless, this input did not trigger parameter resetting. Perhaps some would argue that while the input did not include explicit evidence, it is not truly "primary linguistic data" in that it was nonetheless provided in a structured classroom setting. It may have been in some way "too conscious" to appeal to the grammar building process. Again, it should be noted that during the input flood,

adverbs were incorporated into stories and games in as naturalistic a manner as possible (see appendix A), therefore I believe that such objections would be questionable in this case.

There is one final possible interpretation of the results of this study which is that the input was merely insufficient. The results from the flood group show quite clearly that SAV was learned by the students. It should be noted that on all the tasks, there was also a dip in the SVAO scores from the pretest to the first post-test. These results could be interpreted as indicating the beginnings of a switch in parameter settings. Perhaps, it could be claimed, had the children been exposed to more input, an eventual switch may have occurred, as appears to be the case for one of the subjects (see section 4.3.6). Only further investigation, for example, providing naturalistic positive evidence on adverb placement for a longer period of time, could clarify this. It should be noted that as it was, the input was quite intense and provided, I believe, far more input on adverbs than would occur in normal speech. It is highly unlikely that the learner would encounter adverbs with such frequency in unmodified input - a fact which could perhaps explain why French learners of English have such difficulty with this aspect of English grammar (White 1989b).

## 5.3. Conclusion

This study on the role of positive evidence in the resetting of the verb movement parameter has shown that intensive positive evidence on one aspect of the parameter was not sufficient to trigger resetting to the L2 value by these learners. Rather, these subjects use orders consistent with both values of the parameter following exposure to the input flood. These results may have certain implications for approaches to learnability in SLA. If, indeed, these subjects have adopted both values of the verb movement parameter, then preemption appears not to be operating as for L1 acquisition in this case, in that primary linguistic data containing evidence for one value of the parameter does not automatically

trigger resetting to that value. It is possible, however, that these results captured the learners' behaviour during a period in acquisition when both values of a parameter may be adopted simultaneously until one or the other wins out on the basis of distributional evidence in the input (Berwick 1985, Valian 1990). On the other hand, the flood group may simply have learned that English has a pre-INFL adverb position for base generating adverbs, in which case, contrary to L1 acquisition, positive evidence in the input has not affected parameter setting here at all.

Only further investigation focussing, for example, on the placement of adverbs in sentences containing modals as in (3), (in order to determine which of the syntactic representations proposed above is correct for these subjects), or testing following a prolonged period of exposure to the flood of input (in order to determine whether a single parameter setting will eventually win out on the basis of input like that provided here) could disambiguate the various interpretations proposed in this chapter.

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## Appendix A Sample Classroom Activities

### (i) Questionnaire

My name _
My partner

1. Do you make supper sometimes? _ _
   What do you usually cook?
   I usually cook _ _ _____ _ _ _ _____ _ _ _ _ _ _ _ _ _

2. Do you often do the dishes at your house? _____
   Who usually does the dishes at your house?
   _____ usually does the dishes at my house.

3. Do you have an animal? _____
   Who usually feeds it?
   _____ usually feeds it

4. Do you always do your homework? _____
   Who helps you with your homework sometimes ?
   _____ sometimes helps me with my homework

5. Do you ever wash the floor? _ _ _ _
   What do you usually use to wash the floor?
   I usually use _ _ _ _____ to wash the floor.

6. Does your mother often tell you to clean your room? _ _ _ _
   Why do you sometimes forget to clean your room?
   Sometimes, I forget to clean my room because _ _ _____ _ _ _ _
   _____

7. Do you ever eat ice-cream in the summer? _ _ _ _ _
   What flavour ice-cream do you usually buy?
   I usually buy _____ ice-cream

8. Do you always eat everything on your plate? _____
   What food do you never eat?
   I never eat _____

9. Do you ever play tennis? _____
   What sport do you usually play in the winter?
   In the winter I usually _____

10. Do you ever listen to music? _____
    What kind of music do you never listen to?
    I never listen to _____

## (ii) Game

To the teacher

For this activity, the class should be divided into two teams. You have a set of numbered index cards. On each card is a scrambled word. You also have a list of numbered sentences which will serve as clues that only you may see. Show each team one card. Then read out the sentence clue that corresponds to that word. The team will have 1 minute (or less) to unscramble the word. For each unscrambled word, the team gets a point. If they can't unscramble it, the other team gets a try and the point if they succeed. Then the other team gets shown a word, and so on. The team that reaches 30 first wins.

| Clues | Cards |
|---|---|
| 1. When it's sunny, we often go to the _____ | ABCTH |
| 2. I always send my friend a _____ on her birthday | DACR |
| 3. When I'm tired I usually go to _____ | DBL |
| 4. When I go to the lake, I always catch a lot of _____. | IHTS |
| 5. We often buy _____ for the car | ASG |
| 6. In the winter, I sometimes play _____ with my friends. | ECHYOK |
| 7. When I'm in a rush, I sometimes forget my _____. | KSYE |
| 8. When I hear a funny joke, I always _____. | HULAG |
| 9. I usually eat three _____ a day | AMLES |
| 10. When I play the drums, I always make a lot of _____ | SNIOE |
| 11. A car usually has four _____ | RTIES |
| 12. In the spring, my father always plants flowers in the _____. | DGAENR |
| 13. I always study a lot when I have a _____ | SETT |
| 14. I often eat an _____ with lunch | GONARE |
| 15. I usually write with a _____ | ENP |
| 16. I always use _____ to wash my hands. | ASOP |
| 17. At Christmastime, my family always visits my _____ | NUTA |
| 18. When I'm sick I usually visit the _____. | CTROOD |
| 19. In the morning, I always wash my _____. | EACF |
| 20. When there are no chairs, we sometimes sit on the _____. | LOROF |
| 21. Grass is usually _____. | GNERE |
| 22. At the farm, I usually ride the _____. | SERHOS |
| 23. I always use a _____ to cut my steak. | FIENK |
| 24. In the summer, I often mow the _____. | WANI |
| 25. I always eat my cereal with _____ | KIML |
| 26. People sometimes go to work by _____. | NARIT |
| 27. When I go to the beach, I usually take a _____. | WOTEL |
| 28. I always brush my _____ after I eat. | ETTHE |
| 29. We usually sit on a _____ | IAHCR |
| 30. On nice days we always _____the window. | ENPO |
| 31. When my mother sleeps, I am always very _____. | TUIQE |
| 32. When I go to the beach, I always get _____ in my shoes. | NADS |
| 33. I often eat _____ for breakfast | ONABC |
| 34. The teacher always uses _____on the blackboard. | KHACL |
| 35. When we go camping, we often cook over a _____ | REIF |
| 36. When I eat, I often use a _____. | KFRO |
| 37. I sometimes help my mother clean the _____. | SUHOE |
| 38. An _____ is always surrounded by water. | LDAISN |
| 39. When it's windy, I sometimes fly my _____. | TIEK |
| 40. When I go to sleep, I always turn off the _____. | IGTLH |
| 41. I often listen to _____ on the radio. | SMUIC |

| | |
|---|---|
| 42. Animals often have a _____. | LAIF |
| 43. I never _____ to school when it rains | LAWK |
| 44. I often wear a hat in the _____. | TEINRW |
| 45. Cars usually drive on a _____. | AROD |
| 46. I always get lots of _____on my birthday. | LTTGS |
| 47. I usually _____ my bike to school. | IEDR |
| 48. I never wear _____ when I go swimming. | LHOSS |
| 49. When we play soccer, we always use a _____ | LABI |
| 50. When I'm dirty I often take a _____ | TABH |
| 51. When I'm hungry, I always ___ | ETA |
| 52. I often play _____ with my friends. | SMAEG |
| 53. I always brush my ____ after I get up. | RIHA |
| 54. I often listen to _____ music | ZAJZ |
| 55. I often eat a sandwich for _____ | NLUHC |
| 56. In the winter, water often turns to _____. | LIC |
| 57. I never walk alone at _____. | TIHGN |
| 58. When we go camping, we sometimes sleep in a ____. | ENTT |
| 59. When I play tennis, I usually ___. | NWI |
| 60. I sometimes do the _____ after supper. | SDSIHE |
| 61. I always use a _____ to sweep the floor. | MROBO |
| 62. I never play in the _____when it rains | RPAK |
| 63. I often listen to the _____ | OARDI |
| 64. I always put _____ on my french fries | LAST |
| 65. When I cook supper, I always wear an _____. | NPROA |
| 66. When I need money, I sometimes go to the _____. | KNBA |
| 67. In the winter, I rarely wear _____. | RSTHOS |
| 68. In the summer, I never wear _____. | LVOSLG |
| 69. My doctor usually asks about my _____. | AHLHLT |
| 70. I always laugh when I hear a funny _____ | KJEO |
| 71. I often go fishing at the ____ | KAEI |
| 72. The postman always brings the _____ | ILAM |
| 73. I usually eat lunch at ____ | ONON |
| 74. In autumn, the leaves usually fall from the _____. | EREST |
| 75. My parents sometimes drink _____ with their meal. | WENI |
| 76. When I'm on vacation, I usually stay in a ____. | TEOHI |
| 77. I always put _____ on my hamburger. | NONOIS |
| 78. My father often _____ the house in the spring | TPINAS |
| 79. I often run _____ with my team. | CRESA |
| 80. In the morning, I usually walk to _____. | HOCOLS |

## (iii) Story

To the teacher
Give each child a copy of the Encyclopedia Brown story "The Case of the Hungry Hitchhiker". Tell the children who Encyclopedia Brown is according to the following description.

Encyclopedia Brown lives in Idaville. He is ten years old and he likes to solve mysteries. Encyclopedia's father is the Chief of police in Idaville. Everybody thinks that the police in Idaville are the best in the world. But, Chief Brown knows that it's Encyclopedia who helps him solve the most difficult cases. They discuss the cases at dinner, and Encyclopedia often solves them immediately. But no one else knows. Who would believe it anyway?

Read the story aloud and have them follow along. Following the reading, they should get in pairs and try to solve the mystery. Ask the children to tell you their solutions, and then read the real solution given below.

In the afternoons, Encyclopedia Brown often went fishing with his friends. On very hot evenings Chief Brown sometimes drove by the river and gave Encyclopedia a ride home. "This feels great," said Encyclopedia happily as he got into the air-conditioned control car one evening. "It's very hot."

"It's ninety three degrees," said his father.

Suddenly, a voice spoke loudly on the police radio. There had been a holdup at the Royal Bank ten minutes ago. The four robbers had escaped in a blue car. The car was going north quickly on the highway.

Encyclopedia's father quickly called the police station.

"This is Chief Brown," he said carefully. "I'll go to the highway. Send cars four and five out and call the other stations immediately." Chief Brown quickly turned the car around.

Silently, Encyclopedia watched his father. He was smiling happily. He had never chased robbers before.

"We won't see them," said Chief Brown slowly. "They are moving too quickly. I hope someone saw what road they took."

Chief Brown drove carefully on the highway. Encyclopedia saw a hitchhiker waiting patiently for a ride He was a young man with a big bag.

"If the car came this way, that hitchhiker must have seen it!" cried Encyclopedia loudly.

"Maybe," answered Chief Brown. "It depends on how long he's been standing there."

Chief Brown stopped next to the hitchhiker.

"How long have you been waiting here?" he asked.

"About an hour," answered the man carefully.

"Did a blue car go quickly past?"

"Yes!" said the hitchhiker loudly. "It went that way. They were driving very dangerously."

"Get in," said Chief Brown quickly.

The man looked silently at Chief Brown's uniform. "Why?" he asked nervously. "Is it illegal to hitchhike?"

"No, don't worry," said Chief Brown. "Would you know the car if you saw it?"

"Yes," said the man and he got quickly into the car. He slowly opened his bag.

"Would you like an orange?" he asked Encyclopedia kindly. "Or some chocolate?"

"Some chocolate, please," answered Encyclopedia.

Encyclopedia took the chocolate bar from the man. He broke off two pieces. The chocolate was very hard. He gave back the rest.

The hitchhiker put the candy in his bag. The man slowly began to eat his orange. He put his garbage carefully into a paper bag.

Encyclopedia ate the chocolate slowly. Suddenly, he was very scared. He slowly took a pencil from his pocket, but he had no paper.

"Could I have some more chocolate?" asked Encyclopedia nervously.

The hitchhiker laughed quietly and gave Encyclopedia his chocolate bar

Encyclopedia ate the chocolate quickly. Slowly and carefully, he wrote on the paper: Hitchhiker is robber. Then he silently put the paper near his father. Chief Brown looked at the paper quickly and continued driving. Finally, they arrived at the police station. Chief Brown slowly opened the car door. Suddenly, he was standing by the hitchhiker's door. He carefully pointed his gun at the man.

"We missed your friends, but we've got you," he said angrily. "You're under arrest!"

## HOW DID ENCYCLOPEDIA KNOW THE HITCHHIKER WAS A ROBBER?

### SOLUTION

The hitchhiker made a mistake when he gave Encyclopedia the chocolate bar The chocolate was hard. But the man had said that he was waiting by the road for an hour on a hot day when the temperature had reached 93 degrees The chocolate bar would have melted in the heat. It would have been very soft. The hitchhiker lied because he was a robber who was supposed to direct the police away from the blue car. The man explained that he had kept the bag in the cool getaway car until the others left The other robbers were quickly arrested.

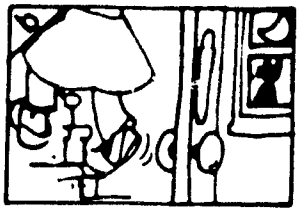
Adapted from:

Sobol, D. J. The Case of the Hungry Hitchhiker, In *Encyclopedia Brown and the Case of the Secret Pitch.* Bantam Books Inc., New York, 1978. pp. 32-38.

(iv) Picture story

Put these pictures in the correct order to tell a story.

He quickly turned on the light.

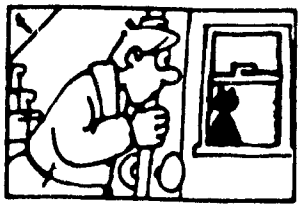


Happily, he went back upstairs.

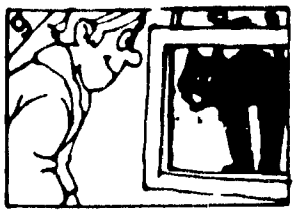
Frank woke up suddenly.

He got into bed.

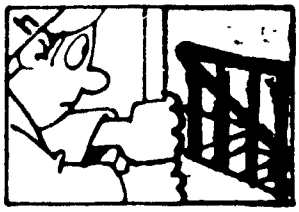
He took off his dressing gown.



He opened the door nervously.



He saw a black cat outside the window.

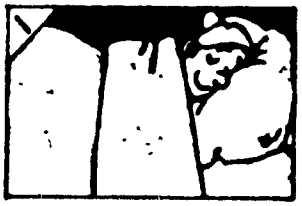


He opened the bedroom door carefully.

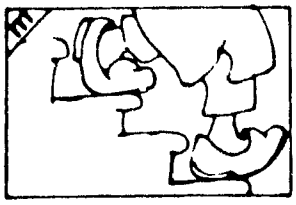
He heard something bang loudly.

Quickly, he put on his dressing gown.

Sleepily, he turned off the light.



He quickly went to sleep.



He went quietly downstairs.

He listened silently at the door.

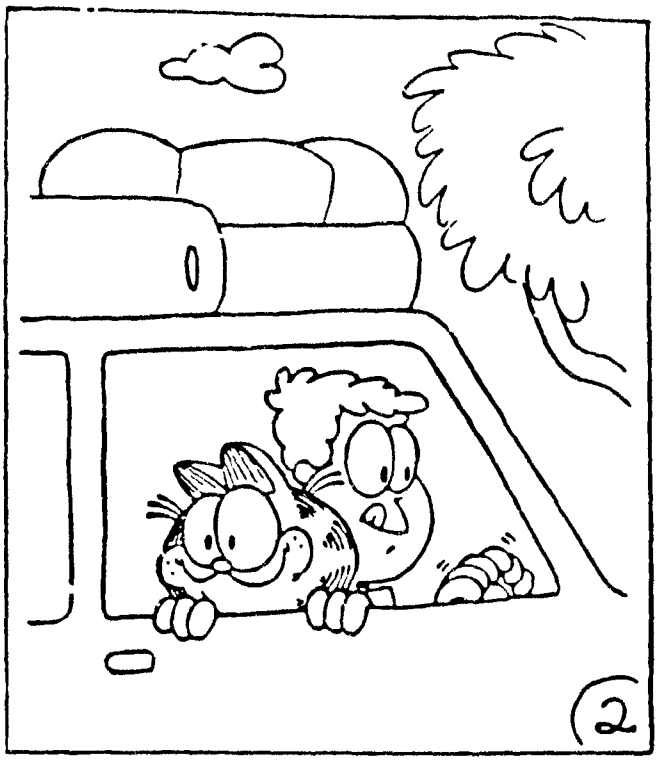
He got out of bed slowly.

1. _____ 2. _____ 3. _____ 4. _____ 5. _____
6. _____ 7. _____ 8. _____ 9. _____ 10. _____

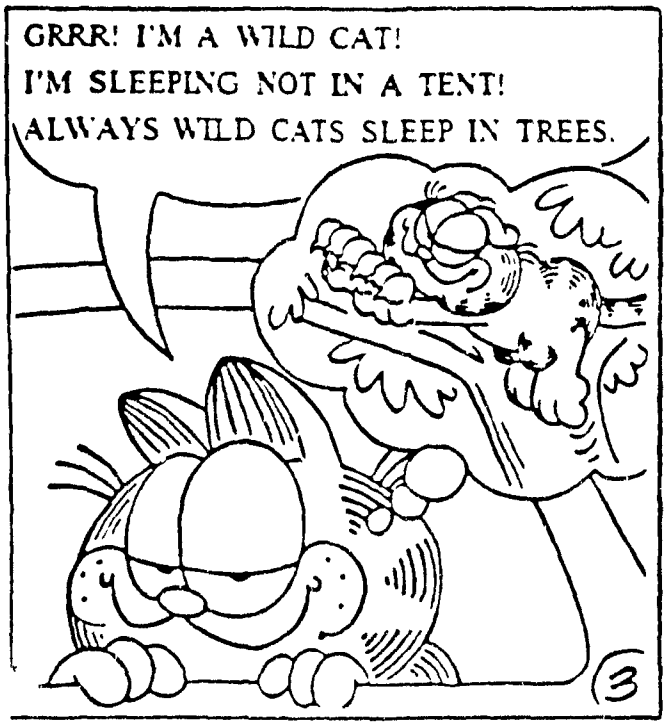
Adapted from:
Granger, C. *Play Games with English Book 2.* Heinemann Educational Books, London, 1981. p. 9.

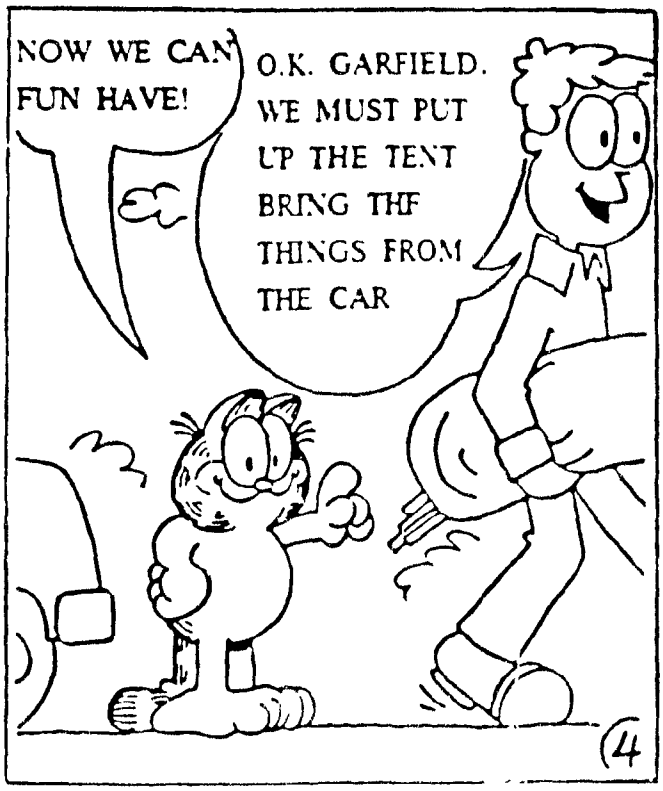
(i) Grammaticality judgement task


GARFIELD AND JOHN USUALLY VISIT CAMP GRIZZLY IN JULY.

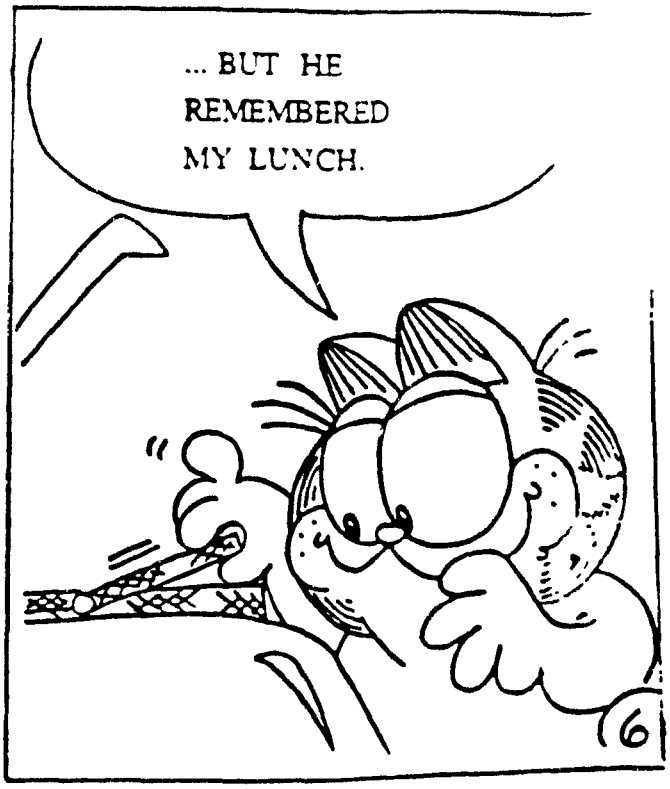



WHEN THEY ARRIVE, JOHN PARKS CAREFULLY THE CAR.

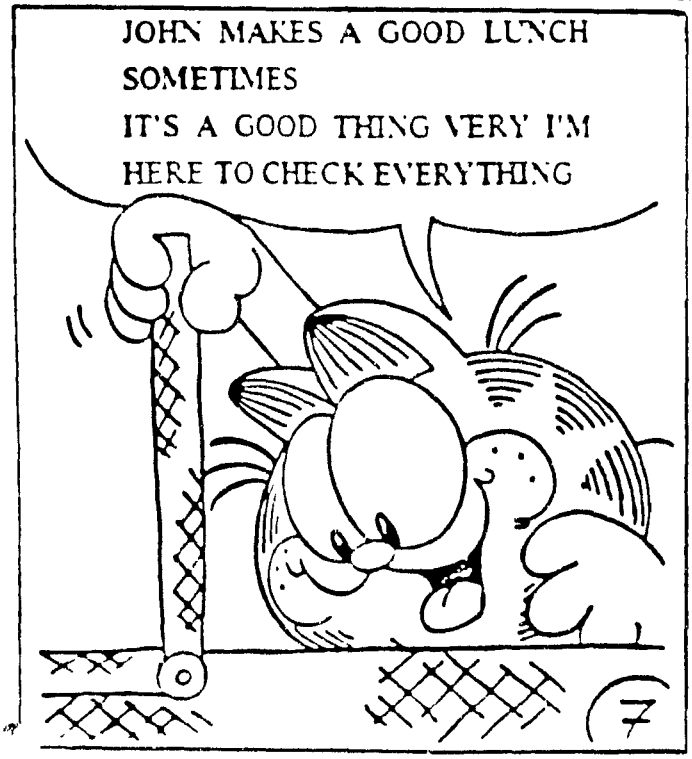


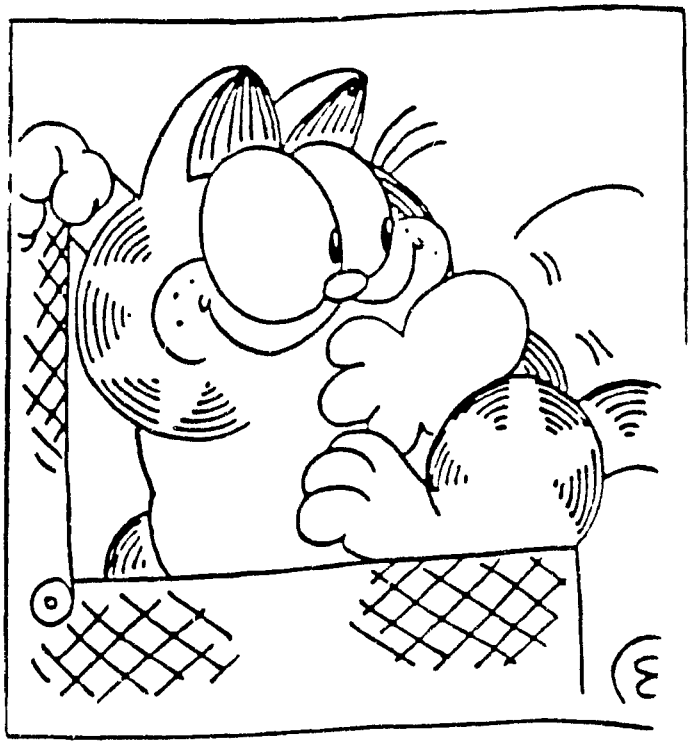




JOHN UNPACKS THE CAR QUICKLY.

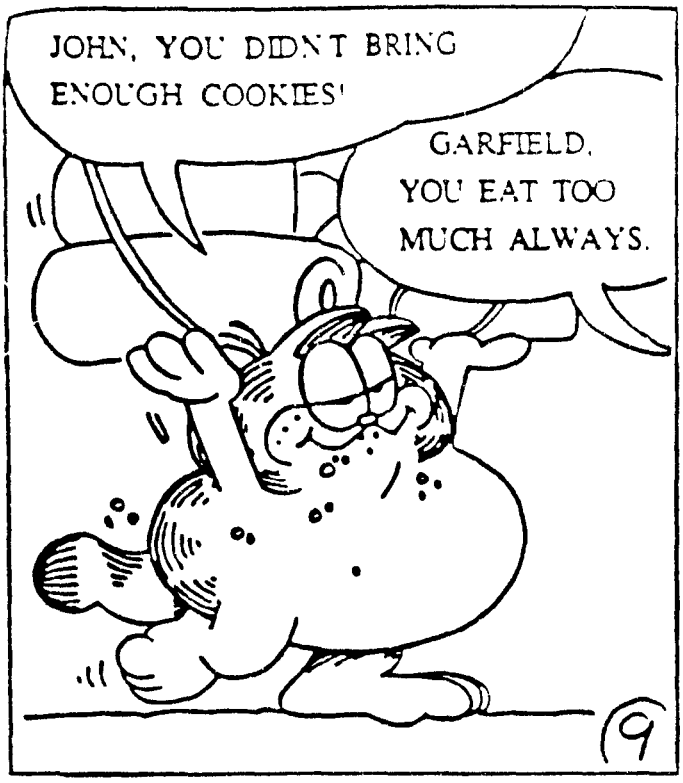




GARFIELD OPENS THE PICNIC BASKET SLOWLY.

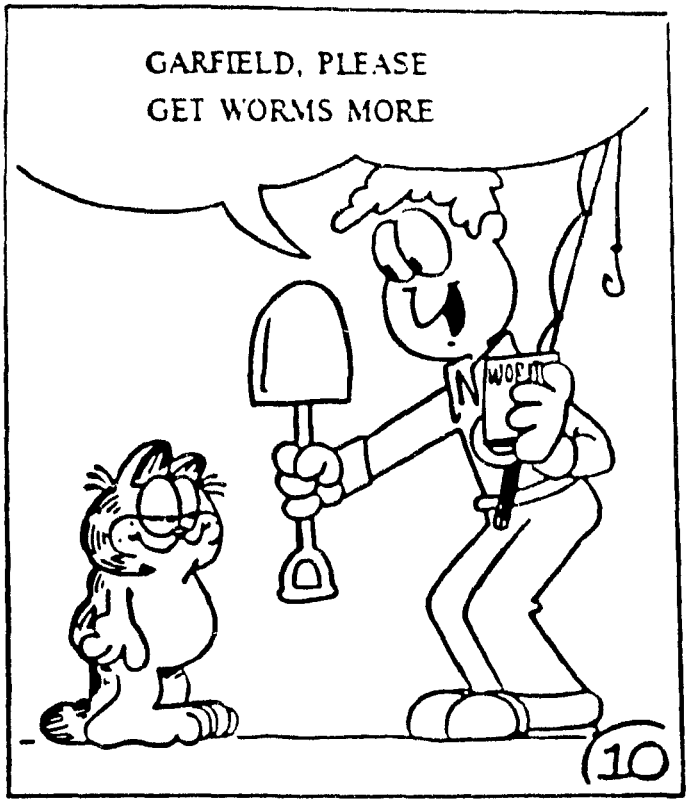


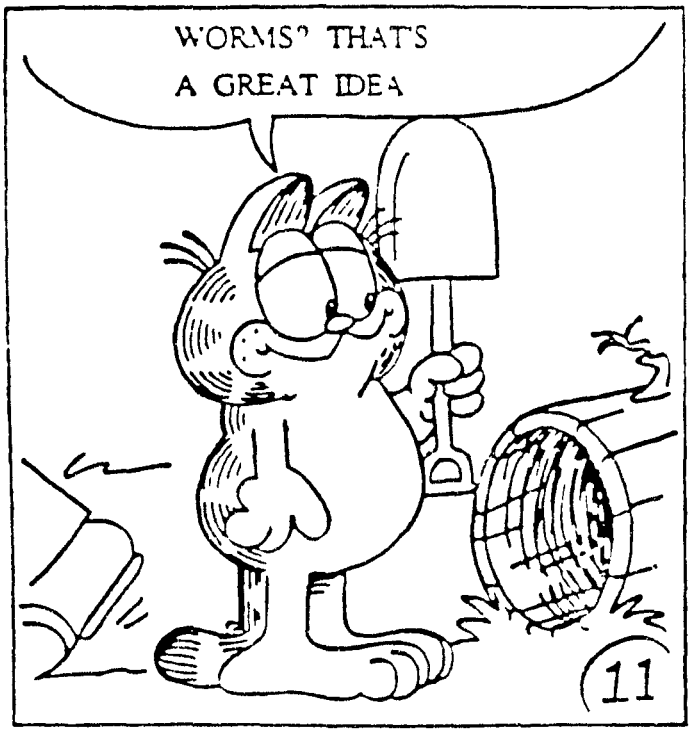

LOOKS GARFIELD FOR JOHN. HE CAREFULLY CLIMBS INTO THE BASKET.

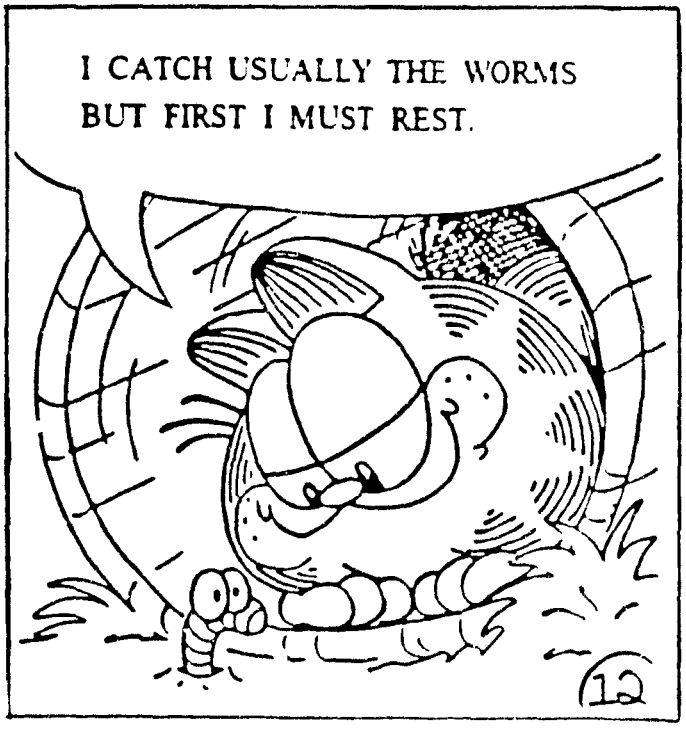



LATER, GARFIELD LEAVES SLOWLY THE CAR.




QUICKLY, JOHN GIVES THE SHOVEL TO GARFIELD.




GARFIELD HIDES CAREFULLY IN A TREE TRUNK


LATER THAT AFTERNOON, JOHN RETURNS SLOWLY TO THE CAMP.



GARFIELD QUICKLY FINDS WOOD FOR THE FIRE


SUPPER AFTER, JOHN TELLS A STORY.

## (ii) Preference task Version A

1. a. Frank works at night often
   b. Frank works often at night.

only a is right | only b is right | both right | both wrong | don't know

2. a. The girl eats quickly the Big Mac.
   b. The girl eats the Big Mac quickly.

only a is right | only b is right | both right | both wrong | don't know

3. a. Lisa has a large very car.
   b. Lisa has a large car very.

only a is right | only b is right | both right | both wrong | don't know

4. a. The old man tells the story slowly.
   b. The old man slowly tells the story.

only a is right | only b is right | both right | both wrong | don't know

5. a. Mary quickly opens the letter.
   b. Mary opens quickly the letter.

only a is right | only b is right | both right | both wrong | don't know

6. a. Superman saves people always.
   b. Superman saves always people.

only a is right | only b is right | both right | both wrong | don't know

7. a. Robert carefully writes with his new pen.
   b. Robert writes carefully with his new pen.

only a is right | only b is right | both right | both wrong | don't know

8. a. Jill eats always at 6:00 P.M.
   b. Jill eats at 6:00 P.M. always.

only a is right  only b is right  both right  both wrong  don't know

9. a. The boys walk to school slowly.
   b. The boys walk slowly to school.

only a is right  only b is right  both right  both wrong  don't know

10. a. Sometimes Susan plays the piano.
    b. Susan plays sometimes the piano.

only a is right  only b is right  both right  both wrong  don't know

11. a. Quickly the children leave the school.
    b. The children leave quickly the school.

only a is right  only b is right  both right  both wrong  don't know

12. a. Charles cuts carefully the paper.
    b. Carefully Charles cuts the paper.

only a is right  only b is right  both right  both wrong  don't know

13. a. Louise plays quietly with her doll.
    b. Louise plays with her doll quietly.

only a is right  only b is right  both right  both wrong  don't know

14. a. The baby usually smiles at her mother.
    b. The baby smiles usually at her mother.

only a is right  only b is right  both right  both wrong  don't know

15. a. Slowly the train leaves the station.
    b. The train slowly leaves the station.

only a is right  only b is right  both right  both wrong  don't know

16. a. Linda takes always the metro.
    b. Linda always takes the metro.

only a is right  only b is right  both right  both wrong  don't know

17. a. Harry runs quickly to his house.
    b. Harry quickly runs to his house.

only a is right  only b is right  both right  both wrong  don't know

18. a. The students quietly write the test.
    b. Quietly the students write the test.

only a is right  only b is right  both right  both wrong  don't know

19. a. Helen visits often her grandmother.
    b. Helen visits her grandmother often.

only a is right  only b is right  both right  both wrong  don't know

20. a. Tom to work drives a motorcycle.
    b. Tom a motorcycle drives to work.

only a is right  only b is right  both right  both wrong  don't know

21. a. David watches television sometimes.
    b. David sometimes watches television.

only a is right  only b is right  both right  both wrong  don't know

22. a. To visit New York John wants.
    b. John wants to visit New York.

only a is right  only b is right  both right  both wrong  don't know

23. a. Jack usually drinks Coke.
    b. Jack drinks Coke usually.

only a is right  only b is right  both right  both wrong  don't know

24. a. Alice brushes carefully her hair.
    b. Alice carefully brushes her hair.

only a is right  only b is right  both right  both wrong  don't know

25. a. Tony often forgets his homework.
    b. Tony forgets often his homework.

only a is right  only b is right  both right  both wrong  don't know

26. a. Peter quietly closes the door.
    b. Peter closes the door quietly.

only a is right  only b is right  both right  both wrong  don't know

27. a. Pierre speaks usually French.
b. Usually Pierre speaks French

only a is right only b is right both right both wrong don't know

28. a. Anna drives her new car carefully.
b. Anna drives carefully her new car.

only a is right only b is right both right both wrong don't know

29. a. Often Mary loses her books.
b. Mary often loses her books.

only a is right only b is right both right both wrong don't know

30. a. Angela always washes the dishes.
b. Always Angela washes the dishes.

only a is right only b is right both right both wrong don't know

31. a. Carole hates the smell of cigarettes.
b. Carole the smell of cigarettes hates.

only a is right only b is right both right both wrong don't know

32. a. Jane goes sometimes to the movies.
b. Jane sometimes goes to the movies.

only a is right only b is right both right both wrong don't know

# Preference task Version B

1. a Children hate homework usually.
   b Children hate usually homework

only a is right  only b is right  both right  both wrong  don't know

2. a. Carole hates the smell of cigarettes
   b. Carole the smell of cigarettes hates.

only a is right  only b is right  both right  both wrong  don't know

3. a. Harry runs to his house quickly.
   b. Harry runs quickly to his house.

only a is right  only b is right  both right  both wrong  don't know

4. a Jane goes to the movies sometimes.
   b. Jane goes sometimes to the movies.

only a is right  only b is right  both right  both wrong  don't know

5. a. The children leave the school quickly.
   b The children quickly leave the school.

only a is right  only b is right  both right  both wrong  don't know

6. a. The girls read the books quietly.
   b The girls read quietly the books.

only a is right  only b is right  both right  both wrong  don't know

7. a. Lisa has a large very car.
   b. Lisa has a large car very.

only a is right  only b is right  both right  both wrong  don't know

8. a. The old man slowly tells the story.
   b. The old man tells slowly the story.

only a is right  only b is right  both right  both wrong  don't know

9. a. Often Tony forgets his homework.
   b. Tony forgets often his homework.

only a is right  only b is right  both right  both wrong  don't know

10. a. Louise quietly plays with her doll.
    b. Louise plays quietly with her doll.

only a is right  only b is right  both right  both wrong  don't know

11. a. Robert writes carefully with his new pen.
    b. Robert writes with his new pen carefully.

only a is right  only b is right  both right  both wrong  don't know

12. a. Jill always eats at 6:00 P.M.
    b. Jill eats always at 6:00 P.M.

only a is right  only b is right  both right  both wrong  don't know

13. a. To visit New York John wants.
    b. John wants to visit New York.

only a is right  only b is right  both right  both wrong  don't know

14. a. Slowly the train leaves the station.
    b. The train leaves slowly the station.

only a is right  only b is right  both right  both wrong  don't know

15. a. Superman always saves people.
    b. Superman saves people always

only a is right  only b is right  both right  both wrong  don't know

16. a. Quickly the girl eats the Big Mac.
    b. The girl quickly eats the Big Mac.

only a is right  only b is right  both right  both wrong  don't know

17. a. Linda takes always the métro.
    b. Always Linda takes the métro.

only a is right  only b is right  both right  both wrong  don't know

18. a. Charles carefully cuts the paper.
    b. Carefully Charles cuts the paper.

only a is right  only b is right  both right  both wrong  don't know

19. a. Susan plays sometimes the piano.
    b. Susan plays the piano sometimes.

only a is right  only b is right  both right  both wrong  don't know

20. a. Mary loses her books often.
    b. Mary often loses her books.

only a is right  only b is right  both right  both wrong  don't know

21. a. The boys walk slowly to school.
    b. The boys slowly walk to school.

only a is right  only b is right  both right  both wrong  don't know

22. a. David sometimes watches television.
    b. David watches sometimes television.

only a is right  only b is right  both right  both wrong  don't know

23. a. Jack drinks usually Coke.
    b. Jack usually drinks Coke.

only a is right  only b is right  both right  both wrong  don't know

24. a. Anna carefully drives her new car.
    b. Anna drives her new car carefully.

only a is right  only b is right  both right  both wrong  don't know

25. a. Frank works often at night.
    b. Frank often works at night.

only a is right  only b is right  both right  both wrong  don't know

26. a. Sometimes Alexandra cleans her room.
    b. Alexandra sometimes cleans her room.

only a is right  only b is right  both right  both wrong  don't know

27. a. The students write quietly the test.
b. Quietly the students write the test.

only a is right only b is right both right both wrong don't know

28. a. Pierre usually speaks French.
b. Usually Pierre speaks French.

only a is right only b is right both right both wrong don't know

29. a. Tom to work drives a motorcycle.
b. Tom a motorcycle drives to work.

only a is right only b is right both right both wrong don't know

30. a. Peter closes quietly the door.
b. Peter quietly closes the door.

only a is right only b is right both right both wrong don't know

31. a. The girls finish slowly their work.
b. The girls finish their work slowly.

only a is right only b is right both right both wrong don't know

32. a. The baby smiles usually at her mother.
b. The baby smiles at her mother usually.

only a is right only b is right both right both wrong don't know

### (iii) Sentence manipulation task

Randomly assign children to either Version A or Version B sentences; in other words, each child will manipulate four sentences.

Training sentence (for both versions):

The big boy sees the little girl.

Version A.

Test sentences:

1. Paul plays hockey (usually)
2. Mary eats pizza (always)
3. John rides the bicycle (slowly)
4. The children walk to the library (quietly)

Version B.

Test sentences:

5. Peter plays hockey (often)
6. Mary eats pizza (sometimes)
7. John rides the bicycle (carefully)
8. The children walk to the library (quickly)

## (iv) Oral production task

Randomly assign children to either Version A or Version B sentences; in other words, each child will describe four pictures.

Training sentence (for both versions):

The woman is **sad.**

Version A.

Test pictures:

1. make bed (usually)
2. brush teeth (always)
3. comb hair (slowly)
4. watch television (quietly)

Version B.

Test pictures:

5. wash hands (often)
6. do dishes (sometimes)
7. wash car (carefully)
8. ride bike (quickly)

# Appendix C Individual scores

## (i) Grammaticality judgement task SVAO scores

| | Subj no | Grade | Teacher | Group | pretest | 1st post | 2nd post |
|---|---|---|---|---|---|---|---|
| 1 | 1 | g5 | DS | Flood | 3 | 3 | 3 |
| 2 | 3 | g5 | DS | Flood | 5 | 4 | 0 |
| 3 | 4 | g5 | DS | Flood | 4 | 3 | 3 |
| 4 | 5 | g5 | DS | Flood | 0 | 0 | 1 |
| 5 | 6 | g5 | DS | Flood | 5 | 1 | 0 |
| 6 | 7 | g5 | DS | Flood | 2 | 0 | 0 |
| 7 | 8 | g5 | DS | Flood | 4 | 2 | 1 |
| 8 | 9 | g5 | DS | Flood | 1 | 1 | 0 |
| 9 | 10 | g5 | DS | Flood | . | 2 | 3 |
| 10 | 11 | g5 | DS | Flood | 2 | 0 | 4 |
| 11 | 12 | g5 | DS | Flood | 4 | 2 | 3 |
| 12 | 13 | g5 | DS | Flood | 2 | 1 | 0 |
| 13 | 14 | g5 | DS | Flood | 6 | 2 | 3 |
| 14 | 16 | g5 | DS | Flood | 3 | 1 | 1 |
| 15 | 17 | g5 | DS | Flood | 1 | 0 | 1 |
| 16 | 18 | g5 | DS | Flood | 0 | 2 | 1 |
| 17 | 19 | g5 | DS | Flood | 3 | 1 | 0 |
| 18 | 20 | g5 | DS | Flood | 2 | . | . |
| 19 | 21 | g5 | DS | Flood | 5 | 2 | 5 |
| 20 | 22 | g5 | DS | Flood | 2 | 1 | 1 |
| 21 | 23 | g5 | DS | Flood | 2 | 3 | 1 |
| 22 | 24 | g5 | DS | Flood | 7 | 1 | 2 |
| 23 | 25 | g5 | DS | Flood | 1 | 1 | 0 |
| 24 | 26 | g5 | DS | Flood | 4 | 3 | 3 |
| 25 | 27 | g5 | DS | Flood | 5 | 5 | 7 |
| 26 | 28 | g5 | DS | Flood | 7 | 3 | 6 |
| 27 | 29 | g5 | DS | Flood | 2 | 2 | 1 |
| 28 | 30 | g5 | DS | Flood | 4 | 2 | 3 |
| 29 | 31 | g5 | DTN | Flood | 2 | 0 | 0 |
| 30 | 32 | g5 | DTN | Flood | 8 | 7 | 5 |
| 31 | 33 | g5 | DTN | Flood | 3 | 0 | 2 |
| 32 | 34 | g5 | DTN | Flood | 5 | 1 | 3 |
| 33 | 35 | g5 | DTN | Flood | 3 | 3 | 1 |
| 34 | 36 | g5 | DTN | Flood | 2 | 2 | 2 |
| 35 | 37 | g5 | DTN | Flood | 2 | 2 | 0 |
| 36 | 38 | g5 | DTN | Flood | 4 | 4 | . |
| 37 | 39 | g5 | DTN | Flood | 5 | 4 | 2 |
| 38 | 40 | g5 | DTN | Flood | 3 | 0 | 0 |
| 39 | 41 | g5 | DTN | Flood | 4 | 5 | 5 |
| 40 | 42 | g5 | DTN | Flood | 2 | . | 3 |
| 41 | 43 | g5 | DTN | Flood | 4 | 2 | 1 |
| 42 | 44 | g5 | DTN | Flood | 3 | 6 | 5 |
| 43 | 45 | g5 | DTN | Flood | 3 | 3 | 2 |
| 44 | 46 | g5 | DTN | Flood | 4 | 3 | 3 |
| 45 | 47 | g5 | DTN | Flood | 6 | 2 | 3 |
| 46 | 48 | g5 | DTN | Flood | 6 | 0 | 0 |
| 47 | 49 | g5 | DTN | Flood | 4 | 3 | 1 |
| 48 | 51 | g5 | DTN | Flood | . | . | . |
| 49 | 52 | g5 | DTN | Flood | 4 | 1 | 1 |
| 50 | 53 | g5 | DTN | Flood | 3 | 2 | . |
| 51 | 54 | g5 | DTN | Flood | 3 | 2 | 4 |
| 52 | 56 | g5 | DTN | Flood | 1 | 2 | 2 |
| 53 | 57 | g5 | DTN | Flood | 4 | 3 | 3 |
| 54 | 58 | g5 | DTN | Flood | 1 | 2 | 1 |

## Grammaticality judgement task SAV scores

| | Subj no | Grade | Teacher | Group | pretest | 1st post | 2nd post |
|---|---|---|---|---|---|---|---|
| 1 | 1 | g5 | DS | Flood | 2 | 4 | 6 |
| 2 | 3 | g5 | DS | Flood | 2 | 8 | 12 |
| 3 | 4 | g5 | DS | Flood | 6 | 5 | 5 |
| 4 | 5 | g5 | DS | Flood | 6 | 6 | 6 |
| 5 | 6 | g5 | DS | Flood | 5 | 4 | 4 |
| 6 | 7 | g5 | DS | Flood | 6 | 7 | 7 |
| 7 | 8 | g5 | DS | Flood | 2 | 6 | 4 |
| 8 | 9 | g5 | DS | Flood | 6 | 6 | 6 |
| 9 | 10 | g5 | DS | Flood | . | 5 | 5 |
| 10 | 11 | g5 | DS | Flood | 2 | 10 | 7 |
| 11 | 12 | g5 | DS | Flood | 1 | 2 | 5 |
| 12 | 13 | g5 | DS | Flood | 7 | 11 | 14 |
| 13 | 14 | g5 | DS | Flood | 3 | 6 | 5 |
| 14 | 16 | g5 | DS | Flood | 3 | 4 | 4 |
| 15 | 17 | g5 | DS | Flood | 3 | 9 | 5 |
| 16 | 18 | g5 | DS | Flood | 3 | 6 | 4 |
| 17 | 19 | g5 | DS | Flood | 6 | 12 | 12 |
| 18 | 20 | g5 | DS | Flood | 3 | . | . |
| 19 | 21 | g5 | DS | Flood | 2 | 7 | 10 |
| 20 | 22 | g5 | DS | Flood | 2 | 4 | 6 |
| 21 | 23 | g5 | DS | Flood | 3 | 4 | 8 |
| 22 | 24 | g5 | DS | Flood | 3 | 8 | 2 |
| 23 | 25 | g5 | DS | Flood | 4 | 2 | 7 |
| 24 | 26 | g5 | DS | Flood | 3 | 8 | 7 |
| 25 | 27 | g5 | DS | Flood | 1 | 7 | 5 |
| 26 | 28 | g5 | DS | Flood | 1 | 7 | 5 |
| 27 | 29 | g5 | DS | Flood | 7 | 8 | 2 |
| 28 | 30 | g5 | DS | Flood | 4 | 3 | 4 |
| 29 | 31 | g5 | DTN | Flood | 6 | 11 | 12 |
| 30 | 32 | g5 | DTN | Flood | 0 | 3 | 5 |
| 31 | 33 | g5 | DTN | Flood | 0 | 5 | 3 |
| 32 | 34 | g5 | DTN | Flood | 2 | 6 | 7 |
| 33 | 35 | g5 | DTN | Flood | 4 | 5 | 5 |
| 34 | 36 | g5 | DTN | Flood | 3 | 4 | 6 |
| 35 | 37 | g5 | DTN | Flood | 4 | 6 | 6 |
| 36 | 38 | g5 | DTN | Flood | 4 | 4 | . |
| 37 | 39 | g5 | DTN | Flood | 2 | 4 | 4 |
| 38 | 40 | g5 | DTN | Flood | 1 | 6 | 13 |
| 39 | 41 | g5 | DTN | Flood | 4 | 3 | 4 |
| 40 | 42 | g5 | DTN | Flood | 3 | . | 3 |
| 41 | 43 | g5 | DTN | Flood | 1 | 7 | 10 |
| 42 | 44 | g5 | DTN | Flood | 1 | 3 | 5 |
| 43 | 45 | g5 | DTN | Flood | 2 | 6 | 7 |
| 44 | 46 | g5 | DTN | Flood | 5 | 4 | 4 |
| 45 | 47 | g5 | DTN | Flood | 4 | 4 | 5 |
| 46 | 48 | g5 | DTN | Flood | 1 | 12 | 14 |
| 47 | 49 | g5 | DTN | Flood | 5 | 7 | 8 |
| 48 | 51 | g5 | DTN | Flood | . | . | . |
| 49 | 52 | g5 | DTN | Flood | 3 | 4 | 4 |
| 50 | 53 | g5 | DTN | Flood | 3 | 2 | . |
| 51 | 54 | g5 | DTN | Flood | 3 | 6 | 4 |
| 52 | 56 | g5 | DTN | Flood | 4 | 9 | 4 |
| 53 | 57 | g5 | DTN | Flood | 3 | 5 | 4 |
| 54 | 58 | g5 | DTN | Flood | 0 | 3 | 4 |

## (ii) Preference task SVAO scores

| | Subj no | Grade | Teacher | Group | pretest | 1st post | 2nd post |
|---|---|---|---|---|---|---|---|
| 1 | 1 | g5 | DS | Flood | 11 | 8 | 6 |
| 2 | 3 | g5 | DS | Flood | 8 | 7 | 10 |
| 3 | 4 | g5 | DS | Flood | 7 | 9 | 11 |
| 4 | 5 | g5 | DS | Flood | 7 | 4 | 11 |
| 5 | 6 | g5 | DS | Flood | 9 | 5 | 12 |
| 6 | 7 | g5 | DS | Flood | 12 | 0 | 1 |
| 7 | 8 | g5 | DS | Flood | 7 | 11 | 10 |
| 8 | 9 | g5 | DS | Flood | 5 | 6 | 6 |
| 9 | 10 | g5 | DS | Flood | 9 | 9 | 11 |
| 10 | 11 | g5 | DS | Flood | 2 | 6 | 7 |
| 11 | 12 | g5 | DS | Flood | 8 | 8 | 10 |
| 12 | 13 | g5 | DS | Flood | 4 | 5 | 4 |
| 13 | 14 | g5 | DS | Flood | 6 | 10 | 10 |
| 14 | 16 | g5 | DS | Flood | 11 | 12 | 11 |
| 15 | 17 | g5 | DS | Flood | 9 | 5 | 8 |
| 16 | 18 | g5 | DS | Flood | 12 | 11 | 12 |
| 17 | 19 | g5 | DS | Flood | 11 | 4 | 1 |
| 18 | 20 | g5 | DS | Flood | 8 | . | 6 |
| 19 | 21 | g5 | DS | Flood | 11 | 8 | 11 |
| 20 | 22 | g5 | DS | Flood | 9 | 6 | 11 |
| 21 | 23 | g5 | DS | Flood | 9 | 11 | 6 |
| 22 | 24 | g5 | DS | Flood | 10 | 7 | 8 |
| 23 | 25 | g5 | DS | Flood | 8 | 6 | 8 |
| 24 | 26 | g5 | DS | Flood | 11 | 12 | 11 |
| 25 | 27 | g5 | DS | Flood | 10 | 12 | 12 |
| 26 | 28 | g5 | DS | Flood | 10 | 4 | 7 |
| 27 | 29 | g5 | DS | Flood | 5 | 10 | 9 |
| 28 | 30 | g5 | DS | Flood | 9 | 9 | 9 |
| 29 | 31 | g5 | DTN | Flood | 10 | 9 | 10 |
| 30 | 32 | g5 | DTN | Flood | 9 | 11 | 12 |
| 31 | 33 | g5 | DTN | Flood | 6 | 1 | 8 |
| 32 | 34 | g5 | DTN | Flood | 9 | 11 | 12 |
| 33 | 35 | g5 | DTN | Flood | 10 | 9 | 12 |
| 34 | 36 | g5 | DTN | Flood | 9 | 8 | 6 |
| 35 | 37 | g5 | DTN | Flood | 6 | 5 | 7 |
| 36 | 39 | g5 | DTN | Flood | 10 | 4 | 11 |
| 37 | 40 | g5 | DTN | Flood | 7 | 4 | 5 |
| 38 | 41 | g5 | DTN | Flood | 8 | 3 | 5 |
| 39 | 42 | g5 | DTN | Flood | 9 | 10 | 4 |
| 40 | 43 | g5 | DTN | Flood | 8 | 10 | 11 |
| 41 | 44 | g5 | DTN | Flood | 8 | 11 | 12 |
| 42 | 45 | g5 | DTN | Flood | 8 | 8 | 12 |
| 43 | 46 | g5 | DTN | Flood | 9 | 8 | 10 |
| 44 | 47 | g5 | DTN | Flood | 10 | 7 | 4 |
| 45 | 48 | g5 | DTN | Flood | 11 | 4 | 0 |
| 46 | 49 | g5 | DTN | Flood | 10 | 10 | 6 |
| 47 | 51 | g5 | DTN | Flood | 8 | 9 | . |
| 48 | 52 | g5 | DTN | Flood | 9 | 2 | 7 |
| 49 | 53 | g5 | DTN | Flood | 4 | 6 | 5 |
| 50 | 54 | g5 | DTN | Flood | 3 | 5 | 7 |
| 51 | 56 | g5 | DTN | Flood | 10 | 9 | 10 |
| 52 | 57 | g5 | DTN | Flood | 10 | 8 | 9 |
| 53 | 58 | g5 | DTN | Flood | 9 | 10 | 8 |

## Preference task SAV scores

| | Subj no | Grade | Teacher | Group | pretest | 1st post | 2nd post |
|---|---|---|---|---|---|---|---|
| 1 | 1 | g5 | DS | Flood | 5 | 13 | 12 |
| 2 | 3 | g5 | DS | Flood | 7 | 13 | 15 |
| 3 | 4 | g5 | DS | Flood | 8 | 11 | 16 |
| 4 | 5 | g5 | DS | Flood | 8 | 13 | 14 |
| 5 | 6 | g5 | DS | Flood | 13 | 16 | 16 |
| 6 | 7 | g5 | DS | Flood | 4 | 8 | 8 |
| 7 | 8 | g5 | DS | Flood | 5 | 3 | 12 |
| 8 | 9 | g5 | DS | Flood | 7 | 8 | 8 |
| 9 | 10 | g5 | DS | Flood | 5 | 11 | 10 |
| 10 | 11 | g5 | DS | Flood | 5 | 14 | 14 |
| 11 | 12 | g5 | DS | Flood | 7 | 13 | 13 |
| 12 | 13 | g5 | DS | Flood | 5 | 16 | 16 |
| 13 | 14 | g5 | DS | Flood | 7 | 12 | 12 |
| 14 | 16 | g5 | DS | Flood | 11 | 14 | 16 |
| 15 | 17 | g5 | DS | Flood | 5 | 13 | 10 |
| 16 | 18 | g5 | DS | Flood | 8 | 14 | 13 |
| 17 | 19 | g5 | DS | Flood | 7 | 11 | 13 |
| 18 | 20 | g5 | DS | Flood | 8 | . | 13 |
| 19 | 21 | g5 | DS | Flood | 7 | 11 | 15 |
| 20 | 22 | g5 | DS | Flood | 2 | 8 | 8 |
| 21 | 23 | g5 | DS | Flood | 5 | 9 | 11 |
| 22 | 24 | g5 | DS | Flood | 6 | 11 | 10 |
| 23 | 25 | g5 | DS | Flood | 12 | 15 | 15 |
| 24 | 26 | g5 | DS | Flood | 10 | 15 | 1 |
| 25 | 27 | g5 | DS | Flood | 3 | 13 | 15 |
| 26 | 28 | g5 | DS | Flood | 7 | 16 | 4 |
| 27 | 29 | g5 | DS | Flood | 5 | 15 | 13 |
| 28 | 30 | g5 | DS | Flood | 1 | 13 | 16 |
| 29 | 31 | g5 | DTN | Flood | 8 | 13 | 16 |
| 30 | 32 | g5 | DTN | Flood | 1 | 5 | 15 |
| 31 | 33 | g5 | DTN | Flood | 11 | 14 | 16 |
| 32 | 34 | g5 | DTN | Flood | 15 | 16 | 16 |
| 33 | 35 | g5 | DTN | Flood | 7 | 16 | 16 |
| 34 | 36 | g5 | DTN | Flood | 4 | 9 | 11 |
| 35 | 37 | g5 | DTN | Flood | 5 | 12 | 13 |
| 36 | 39 | g5 | DTN | Flood | 5 | 11 | 14 |
| 37 | 40 | g5 | DTN | Flood | 7 | 16 | 16 |
| 38 | 41 | g5 | DTN | Flood | 5 | 12 | 11 |
| 39 | 42 | g5 | DTN | Flood | 5 | 9 | 5 |
| 40 | 43 | g5 | DTN | Flood | 9 | 15 | 16 |
| 41 | 44 | g5 | DTN | Flood | 9 | 12 | 11 |
| 42 | 45 | g5 | DTN | Flood | 3 | 16 | 14 |
| 43 | 46 | g5 | DTN | Flood | 14 | 12 | 16 |
| 44 | 47 | g5 | DTN | Flood | 3 | 8 | 15 |
| 45 | 48 | g5 | DTN | Flood | 3 | 16 | 16 |
| 46 | 49 | g5 | DTN | Flood | 12 | 16 | 16 |
| 47 | 51 | g5 | DTN | Flood | 6 | 9 | . |
| 48 | 52 | g5 | DTN | Flood | 6 | 12 | 9 |
| 49 | 53 | g5 | DTN | Flood | 3 | 6 | 11 |
| 50 | 54 | g5 | DTN | Flood | 6 | 8 | 11 |
| 51 | 56 | g5 | DTN | Flood | 8 | 14 | 15 |
| 52 | 57 | g5 | DTN | Flood | 4 | 13 | 15 |
| 53 | 58 | g5 | DTN | Flood | 7 | 13 | 14 |

## (iii) Sentence manipulation task SVAX scores

| | Subj no | Grade | Teacher | Group | pretest | 1st post | 2nd post |
|---|---|---|---|---|---|---|---|
| 1 | 1 | g5 | DS | Flood | 4 | 1 | 4 |
| 2 | 3 | g5 | DS | Flood | 4 | 4 | 3 |
| 3 | 4 | g5 | DS | Flood | 4 | 2 | 2 |
| 4 | 5 | g5 | DS | Flood | 3 | 4 | 4 |
| 5 | 6 | g5 | DS | Flood | 4 | 4 | 4 |
| 6 | 7 | g5 | DS | Flood | 4 | 0 | 0 |
| 7 | 8 | g5 | DS | Flood | 1 | 3 | 4 |
| 8 | 9 | g5 | DS | Flood | 0 | 2 | 2 |
| 9 | 10 | g5 | DS | Flood | 4 | 2 | 4 |
| 10 | 11 | g5 | DS | Flood | 2 | 1 | 2 |
| 11 | 12 | g5 | DS | Flood | 4 | 3 | 4 |
| 12 | 13 | g5 | DS | Flood | 3 | 3 | 3 |
| 13 | 14 | g5 | DS | Flood | 4 | 3 | 4 |
| 14 | 16 | g5 | DS | Flood | 3 | 0 | 2 |
| 15 | 17 | g5 | DS | Flood | 4 | 3 | 3 |
| 16 | 18 | g5 | DS | Flood | 2 | 4 | 4 |
| 17 | 19 | g5 | DS | Flood | 3 | 3 | 4 |
| 18 | 20 | g5 | DS | Flood | 2 | . | 1 |
| 19 | 21 | g5 | DS | Flood | 4 | 3 | 4 |
| 20 | 22 | g5 | DS | Flood | 4 | 4 | 4 |
| 21 | 23 | g5 | DS | Flood | 3 | 2 | . |
| 22 | 24 | g5 | DS | Flood | 4 | 2 | 4 |
| 23 | 25 | g5 | DS | Flood | 4 | 4 | 4 |
| 24 | 26 | g5 | DS | Flood | 3 | 4 | 4 |
| 25 | 27 | g5 | DS | Flood | 4 | 4 | 4 |
| 26 | 28 | g5 | DS | Flood | 3 | 3 | 4 |
| 27 | 29 | g5 | DS | Flood | 3 | 4 | 3 |
| 28 | 30 | g5 | DS | Flood | 3 | 4 | 4 |
| 29 | 31 | g5 | DTN | Flood | 2 | 1 | 1 |
| 30 | 32 | g5 | DTN | Flood | 4 | 4 | 4 |
| 31 | 33 | g5 | DTN | Flood | 1 | 2 | 4 |
| 32 | 34 | g5 | DTN | Flood | 3 | 1 | 2 |
| 33 | 35 | g5 | DTN | Flood | 4 | 4 | 4 |
| 34 | 36 | g5 | DTN | Flood | 3 | 1 | 2 |
| 35 | 37 | g5 | DTN | Flood | 2 | 2 | 3 |
| 36 | 38 | g5 | DTN | Flood | 4 | 4 | 4 |
| 37 | 39 | g5 | DTN | Flood | 1 | 2 | 3 |
| 38 | 40 | g5 | DTN | Flood | 3 | 1 | 1 |
| 39 | 41 | g5 | DTN | Flood | 3 | 0 | 3 |
| 40 | 42 | g5 | DTN | Flood | 2 | 1 | 4 |
| 41 | 43 | g5 | DTN | Flood | 4 | 4 | 4 |
| 42 | 44 | g5 | DTN | Flood | 3 | 2 | 4 |
| 43 | 45 | g5 | DTN | Flood | 4 | 4 | 4 |
| 44 | 46 | g5 | DTN | Flood | 2 | 2 | 3 |
| 45 | 47 | g5 | DTN | Flood | 3 | 4 | 1 |
| 46 | 48 | g5 | DTN | Flood | 3 | 0 | 0 |
| 47 | 49 | g5 | DTN | Flood | 3 | 2 | 1 |
| 48 | 51 | g5 | DTN | Flood | 2 | 4 | . |
| 49 | 52 | g5 | DTN | Flood | 2 | 3 | 4 |
| 50 | 53 | g5 | DTN | Flood | 3 | 4 | 4 |
| 51 | 54 | g5 | DTN | Flood | 4 | 3 | 4 |
| 52 | 56 | g5 | DTN | Flood | 3 | 4 | 1 |
| 53 | 57 | g5 | DTN | Flood | 4 | 4 | 3 |
| 54 | 58 | g5 | DTN | Flood | 4 | 4 | 4 |

## Sentence manipulation task SAV scores

| | Subj no | Grade | Teacher | Group | pretest | 1st post | 2nd post |
|---|---|---|---|---|---|---|---|
| 1 | 1 | g5 | DS | Flood | 0 | 3 | 4 |
| 2 | 3 | g5 | DS | Flood | 2 | 4 | 4 |
| 3 | 4 | g5 | DS | Flood | 2 | 3 | 2 |
| 4 | 5 | g5 | DS | Flood | 1 | 4 | 4 |
| 5 | 6 | g5 | DS | Flood | 1 | 4 | 4 |
| 6 | 7 | g5 | DS | Flood | 0 | 2 | 2 |
| 7 | 8 | g5 | DS | Flood | 1 | 3 | 4 |
| 8 | 9 | g5 | DS | Flood | 1 | 2 | 2 |
| 9 | 10 | g5 | DS | Flood | 2 | 4 | 4 |
| 10 | 11 | g5 | DS | Flood | 1 | 4 | 3 |
| 11 | 12 | g5 | DS | Flood | 3 | 4 | 4 |
| 12 | 13 | g5 | DS | Flood | 0 | 4 | 4 |
| 13 | 14 | g5 | DS | Flood | 1 | 1 | 3 |
| 14 | 16 | g5 | DS | Flood | 2 | 4 | 4 |
| 15 | 17 | g5 | DS | Flood | 2 | 3 | 3 |
| 16 | 18 | g5 | DS | Flood | 4 | 4 | 4 |
| 17 | 19 | g5 | DS | Flood | 2 | 4 | 3 |
| 18 | 20 | g5 | DS | Flood | 1 | . | 3 |
| 19 | 21 | g5 | DS | Flood | 2 | 3 | 4 |
| 20 | 22 | g5 | DS | Flood | 0 | 3 | 2 |
| 21 | 23 | g5 | DS | Flood | 2 | 3 | . |
| 22 | 24 | g5 | DS | Flood | 3 | 2 | 2 |
| 23 | 25 | g5 | DS | Flood | 4 | 4 | 4 |
| 24 | 26 | g5 | DS | Flood | 2 | 4 | 0 |
| 25 | 27 | g5 | DS | Flood | 1 | 4 | 4 |
| 26 | 28 | g5 | DS | Flood | 3 | 4 | 2 |
| 27 | 29 | g5 | DS | Flood | 1 | 3 | 3 |
| 28 | 30 | g5 | DS | Flood | 0 | 2 | 2 |
| 29 | 31 | g5 | DTN | Flood | 2 | 4 | 4 |
| 30 | 32 | g5 | DTN | Flood | 0 | 0 | 4 |
| 31 | 33 | g5 | DTN | Flood | 3 | 4 | 4 |
| 32 | 34 | g5 | DTN | Flood | 3 | 4 | 4 |
| 33 | 35 | g5 | DTN | Flood | 3 | 4 | 4 |
| 34 | 36 | g5 | DTN | Flood | 0 | 4 | 4 |
| 35 | 37 | g5 | DTN | Flood | 0 | 4 | 3 |
| 36 | 38 | g5 | DTN | Flood | 4 | 4 | 4 |
| 37 | 39 | g5 | DTN | Flood | 4 | 3 | 1 |
| 38 | 40 | g5 | DTN | Flood | 3 | 3 | 3 |
| 39 | 41 | g5 | DTN | Flood | 1 | 1 | 0 |
| 40 | 42 | g5 | DTN | Flood | 1 | 2 | 0 |
| 41 | 43 | g5 | DTN | Flood | 4 | 3 | 4 |
| 42 | 44 | g5 | DTN | Flood | 2 | 3 | 2 |
| 43 | 45 | g5 | DTN | Flood | 2 | 4 | 4 |
| 44 | 46 | g5 | DTN | Flood | 1 | 3 | 3 |
| 45 | 47 | g5 | DTN | Flood | 0 | 3 | 3 |
| 46 | 48 | g5 | DTN | Flood | 0 | 4 | 4 |
| 47 | 49 | g5 | DTN | Flood | 2 | 3 | 3 |
| 48 | 51 | g5 | DTN | Flood | 3 | 4 | . |
| 49 | 52 | g5 | DTN | Flood | 1 | 4 | 4 |
| 50 | 53 | g5 | DTN | Flood | 0 | 3 | 4 |
| 51 | 54 | g5 | DTN | Flood | 4 | 4 | 4 |
| 52 | 56 | g5 | DTN | Flood | 4 | 3 | 2 |
| 53 | 57 | g5 | DTN | Flood | 4 | 3 | 2 |
| 54 | 58 | g5 | DTN | Flood | 4 | 4 | 4 |

## (iv) Oral production task SVAO scores

| | Subj no | Grade | Teacher | Group | pretest | 1st post | 2nd post |
|---|---|---|---|---|---|---|---|
| 1 | 1 | g5 | DS | Flood | 0 | 2 | 0 |
| 2 | 3 | g5 | DS | Flood | 1 | 1 | 0 |
| 3 | 4 | g5 | DS | Flood | 0 | 0 | 0 |
| 4 | 5 | g5 | DS | Flood | 0 | 0 | 0 |
| 5 | 6 | g5 | DS | Flood | 3 | 0 | 0 |
| 6 | 7 | g5 | DS | Flood | 2 | 0 | 0 |
| 7 | 8 | g5 | DS | Flood | 0 | 1 | 0 |
| 8 | 9 | g5 | DS | Flood | 0 | 0 | 0 |
| 9 | 10 | g5 | DS | Flood | 3 | 3 | 3 |
| 10 | 11 | g5 | DS | Flood | 1 | 1 | 0 |
| 11 | 12 | g5 | DS | Flood | 0 | 0 | 0 |
| 12 | 13 | g5 | DS | Flood | 2 | 0 | 0 |
| 13 | 14 | g5 | DS | Flood | 0 | 0 | 0 |
| 14 | 16 | g5 | DS | Flood | 0 | 0 | 0 |
| 15 | 17 | g5 | DS | Flood | 1 | 0 | 0 |
| 16 | 18 | g5 | DS | Flood | 0 | 0 | 0 |
| 17 | 19 | g5 | DS | Flood | 0 | 0 | 0 |
| 18 | 20 | g5 | DS | Flood | 0 | . | 0 |
| 19 | 21 | g5 | DS | Flood | 0 | 1 | 0 |
| 20 | 22 | g5 | DS | Flood | 0 | 0 | 0 |
| 21 | 23 | g5 | DS | Flood | 0 | 0 | . |
| 22 | 24 | g5 | DS | Flood | 2 | 0 | 0 |
| 23 | 25 | g5 | DS | Flood | 0 | 0 | 0 |
| 24 | 26 | g5 | DS | Flood | 1 | 0 | 3 |
| 25 | 27 | g5 | DS | Flood | 1 | 0 | 0 |
| 26 | 28 | g5 | DS | Flood | 0 | 0 | 0 |
| 27 | 29 | g5 | DS | Flood | 0 | 1 | 0 |
| 28 | 30 | g5 | DS | Flood | 1 | 1 | 0 |
| 29 | 31 | g5 | DTN | Flood | 0 | 2 | 1 |
| 30 | 32 | g5 | DTN | Flood | 2 | 2 | 1 |
| 31 | 33 | g5 | DTN | Flood | 0 | 0 | 1 |
| 32 | 34 | g5 | DTN | Flood | 0 | 1 | 3 |
| 33 | 35 | g5 | DTN | Flood | 0 | 0 | 1 |
| 34 | 36 | g5 | DTN | Flood | 1 | 0 | 0 |
| 35 | 37 | g5 | DTN | Flood | 0 | 0 | 0 |
| 36 | 38 | g5 | DTN | Flood | 3 | 0 | 0 |
| 37 | 39 | g5 | DTN | Flood | 0 | 0 | 0 |
| 38 | 40 | g5 | DTN | Flood | 0 | 0 | 0 |
| 39 | 41 | g5 | DTN | Flood | 0 | 0 | 0 |
| 40 | 42 | g5 | DTN | Flood | 0 | 0 | 0 |
| 41 | 43 | g5 | DTN | Flood | 0 | 0 | 0 |
| 42 | 44 | g5 | DTN | Flood | 3 | 0 | 0 |
| 43 | 45 | g5 | DTN | Flood | 2 | 0 | 1 |
| 44 | 46 | g5 | DTN | Flood | 0 | 1 | 0 |
| 45 | 47 | g5 | DTN | Flood | 0 | 0 | 1 |
| 46 | 48 | g5 | DTN | Flood | 0 | 0 | 0 |
| 47 | 49 | g5 | DTN | Flood | 0 | 0 | 0 |
| 48 | 51 | g5 | DTN | Flood | 0 | 0 | . |
| 49 | 52 | g5 | DTN | Flood | 1 | 1 | 1 |
| 50 | 53 | g5 | DTN | Flood | 0 | 1 | 0 |
| 51 | 54 | g5 | DTN | Flood | 0 | 0 | 0 |
| 52 | 56 | g5 | DTN | Flood | 2 | 0 | 0 |
| 53 | 57 | g5 | DTN | Flood | 0 | 0 | 0 |
| 54 | 58 | g5 | DTN | Flood | 0 | 0 | 0 |

## Oral production task SAV scores

| | Subj no | Grade | Teacher | Group | pretest | 1st post | 2nd post |
|---|---|---|---|---|---|---|---|
| 1 | 1 | g5 | DS | Flood | 1 | 0 | 3 |
| 2 | 3 | g5 | DS | Flood | 0 | 2 | 4 |
| 3 | 4 | g5 | DS | Flood | 2 | 3 | 1 |
| 4 | 5 | g5 | DS | Flood | 0 | 0 | 1 |
| 5 | 6 | g5 | DS | Flood | 1 | 1 | 1 |
| 6 | 7 | g5 | DS | Flood | 0 | 2 | 2 |
| 7 | 8 | g5 | DS | Flood | 0 | 1 | 0 |
| 8 | 9 | g5 | DS | Flood | 2 | 1 | 2 |
| 9 | 10 | g5 | DS | Flood | 0 | 0 | 0 |
| 10 | 11 | g5 | DS | Flood | 0 | 1 | 3 |
| 11 | 12 | g5 | DS | Flood | 0 | 1 | 4 |
| 12 | 13 | g5 | DS | Flood | 0 | 4 | 4 |
| 13 | 14 | g5 | DS | Flood | 0 | 0 | 1 |
| 14 | 16 | g5 | DS | Flood | 0 | 1 | 2 |
| 15 | 17 | g5 | DS | Flood | 3 | 4 | 4 |
| 16 | 18 | g5 | DS | Flood | 0 | 2 | 2 |
| 17 | 19 | g5 | DS | Flood | 0 | 2 | 0 |
| 18 | 20 | g5 | DS | Flood | 0 | . | 0 |
| 19 | 21 | g5 | DS | Flood | 1 | 1 | 4 |
| 20 | 22 | g5 | DS | Flood | 0 | 2 | 2 |
| 21 | 23 | g5 | DS | Flood | 1 | 0 | . |
| 22 | 24 | g5 | DS | Flood | 2 | 4 | 3 |
| 23 | 25 | g5 | DS | Flood | 2 | 3 | 4 |
| 24 | 26 | g5 | DS | Flood | 0 | 4 | 0 |
| 25 | 27 | g5 | DS | Flood | 0 | 2 | 4 |
| 26 | 28 | g5 | DS | Flood | 2 | 3 | 4 |
| 27 | 29 | g5 | DS | Flood | 3 | 1 | 3 |
| 28 | 30 | g5 | DS | Flood | 0 | 0 | 0 |
| 29 | 31 | g5 | DTN | Flood | 0 | 1 | 2 |
| 30 | 32 | g5 | DTN | Flood | 0 | 0 | 0 |
| 31 | 33 | g5 | DTN | Flood | 1 | 1 | 1 |
| 32 | 34 | g5 | DTN | Flood | 0 | 1 | 0 |
| 33 | 35 | g5 | DTN | Flood | 2 | 2 | 2 |
| 34 | 36 | g5 | DTN | Flood | 0 | 4 | 4 |
| 35 | 37 | g5 | DTN | Flood | 1 | 4 | 4 |
| 36 | 38 | g5 | DTN | Flood | 0 | 2 | 2 |
| 37 | 39 | g5 | DTN | Flood | 4 | 1 | 1 |
| 38 | 40 | g5 | DTN | Flood | 3 | 4 | 4 |
| 39 | 41 | g5 | DTN | Flood | 0 | 4 | 4 |
| 40 | 42 | g5 | DTN | Flood | 1 | 2 | 2 |
| 41 | 43 | g5 | DTN | Flood | 1 | 2 | 2 |
| 42 | 44 | g5 | DTN | Flood | 0 | 2 | 0 |
| 43 | 45 | g5 | DTN | Flood | 1 | 2 | 1 |
| 44 | 46 | g5 | DTN | Flood | 0 | 0 | 0 |
| 45 | 47 | g5 | DTN | Flood | 0 | 4 | 2 |
| 46 | 48 | g5 | DTN | Flood | 0 | 4 | 4 |
| 47 | 49 | g5 | DTN | Flood | 1 | 3 | 2 |
| 48 | 51 | g5 | DTN | Flood | 0 | 2 | . |
| 49 | 52 | g5 | DTN | Flood | 0 | 1 | 0 |
| 50 | 53 | g5 | DTN | Flood | 0 | 2 | 0 |
| 51 | 54 | g5 | DTN | Flood | 1 | 4 | 3 |
| 52 | 56 | g5 | DTN | Flood | 0 | 2 | 0 |
| 53 | 57 | g5 | DTN | Flood | 0 | 4 | 2 |
| 54 | 58 | g5 | DTN | Flood | 0 | 1 | 1 |