

The Nature of Specific Language Impairment: Optionality and Principle Conflict

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of the requirements for the degree of Doctor of Philosophy**

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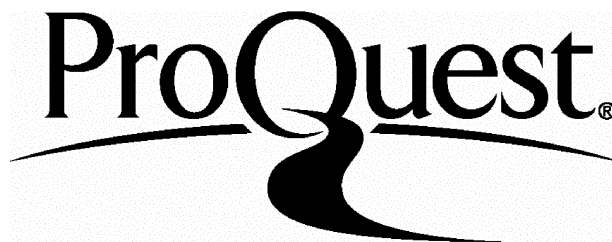
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'I see nobody on the road,' said Alice.
'I only wish I had such eyes,' the King remarked in a fretful tone. '
To be able to see Nobody! And at that distance too!
Why it's as much as I can do to see real people, by this light!....

ABSTRACT

This thesis focuses upon two related goals. The first is the development of an explanatory account of Specific Language Impairment (SLI) that can effectively capture the variety and complexity of the children's grammatical deficit. The second is to embed this account within a restrictive theoretical framework.

Taking as a starting point the broad characterisation of the children's deficit, developed by Heather van der Lely in her RDDR (Representational Deficit for Dependant Relations) research program, I refine and extend her position by proposing a number of principled generalisations upon which a theoretical explanation can be based.

These generalisations embody three specific claims; that SLI is a disorder that affects both productive and receptive language, that SLI children's errors are mainly errors of omission and not commission, and that even the children's ungrammatical production is representative of their grammar. I motivate these claims and consider how they might inform the development of a theoretical account of the disorder.

My theoretical proposals are based on the concept of Principle Conflict. I propose that the SLI child's grammar contains two principles which conflict in a way that makes them each select different optimal derivations from a given lexical array. As a result of this conflict, the child optionally produces a range of constructions which are ungrammatical for the Normal Development grammar.

My proposals make a number of empirical predictions for the children's speech. I present findings from a range of experimental studies which test many of my predictions for the domain of syntactic Negation. Negation is examined because it is a relatively new area of research and provides a range of interesting diagnostics for the particular syntactic phenomena which is my interest.

Finally I consider the implications of my findings for my explanatory account. I also examine some of the most recent theoretical developments in the Minimalist program and discuss how my account can accommodate these.

Now my thesis is done, I should take this time to thank the people who helped make it possible.

First of all, I want to thank my teacher, Neil Smith. It has been an honour to work under his supervision. Neil's dedication to his students and to linguistics is incredible. He has consistently inspired me and I have never left his office without feeling a little better about myself and the world in general. My main regret is that now I'm finished I won't see him as often. However, he really should get an office lower down the building, all those steps! I tried counting them in base 12 as he suggested, but it doesn't help.

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(and he's quite a good linguist too). If I forgot anyone, I'm really sorry. Please insert your name here _____.

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Chapter 1.

1. Introduction.

“Ever since man first mused about his own nature, it has been the gift of language that has surprised him most. If we search through the most primitive and the most ancient evidence of intellectual activity, through myths, magic, or religions, we will find one question that is repeated over and over; from what source comes the power of speech?” Lenneberg, 1967.

The acquisition of language (and its possession) is the quintessential human trait. While there is no other animal, however perfect or fortunately circumstanced which displays this quality, the human child, despite the enormous diversity in the cultures and settings in which it grows up, acquires its native tongue with remarkable speed and efficiency.

The question of how children achieve this feat is perhaps the central issue addressed by linguistic theory, and in particular the Principles and Parameters framework (P&P) (cf. Chomsky, 1981). P&P proposes that the efficiency observed in language development can be explained by proposing a significant genetic basis to language which pre-specifies these abilities in the human child. This genetic endowment takes two forms; the *Principles* of human language, which are taken to be inflexible universals that bind the structure and development of all natural languages, and the *parameters* of human language which are a set of binary choices that begin unspecified and are set to one of two values during the acquisition process.

From this basis, the job of linguistic theorists has been to discover the nature of these genetic components. This has involved addressing the question of what constitutes our knowledge of language. For the main part, linguists have approached this task by observing natural languages and their development, by hypothesising the nature of the ‘language faculty’ and then testing these predictions on a variety of natural languages. However, this is not the only avenue through which the nature of language can be observed. Some of the clearest evidence in this respect comes from cases where language fails to develop correctly, and Specific Language Impairment (SLI) is an instance of this.

SLI provides evidence that language can be selectively impaired in an otherwise normally-developing child. It provides an opportunity to understand more about what

makes language learning distinct from other cognitive functions by studying language development in children who lack some aspect of this innate specialisation.

This thesis will focus upon the language of children who suffer from SLI. I will consider how the children's language can be characterised and argue that its nature and variation can be fully captured within linguistic theory. In the subsequent sub-sections, I will briefly mention some of my conceptual and theoretical assumptions. I will also describe some of the specifics regarding the Minimalist Program for linguistic theory which will provide my theoretical basis, and then lay out the organisation of the rest of the thesis.

1.1 Approach to SLI

I have not approached SLI children's language as an imperfect construct, but rather have crucially assumed that their language is an expression of a grammatical system which differs from the mature-state grammar of normal development. As the normal development grammar would specify an utterance as grammatical, so the SLI child's grammar specifies another (or others). This assumption is not trivial and, in due course, I will address proposals which are fundamentally at odds with it.

The endeavour of capturing SLI children's language within a linguistic theory differs from the same process with respect to natural languages. The SLI child's grammar may well originate from a difference between the principles which constrain it and those which constrain natural languages. In the process of characterising SLI, we may suggest that certain principles, proposed on the basis of the study of natural languages are absent from the children's language. There may appear to be some tension between denying that SLI children are 'imperfect' and limiting the characterisation of their condition to the absence of constraints. While this is to some extent valid, the idea I hope to express is that SLI children's language is the product of their grammatical structure and any differences in their language are entirely expressed by this grammar.

If we hold this view of SLI, then the value of studying the disorder becomes apparent. It allows us to test the predictions of a grammatical framework from a new perspective; by examining what should happen if specific components are removed.

1.2 Theoretical basis

I assume, as the theoretical basis for this thesis, the Minimalist Program for linguistic theory initiated by Chomsky (1993). Putting aside the issue of the entire validation of the minimalist theory I will, in this sub-section, briefly sketch out some of the major conceptions and assumptions which will turn out to be crucial in the discussions to follow.

The basic assumptions from which the Minimalist Program begins can be found in what Chomsky calls ‘virtual conceptual necessity’. The Minimalist Program assumes that language is, as near as possible, an optimal solution to its design specifications. The role of the minimalist endeavour is to identify these design specifications and consider their effect on the optimal version of grammar.

The language faculty, if it is to be usable, needs to interface with a variety of distinct cognitive systems. These systems have to be able to access and interpret the expressions generated by the language faculty. In order to achieve this, certain ‘legibility conditions’ need to be met. It is these legibility conditions which affect the design specifications for the language faculty.

Consider an analogy. When a drop of water falls in to a pool, assuming all else is equal (that the surface of the pool is calm, for example), the ripples generated by the impact should produce a perfect circle. This is how the Minimalist Program assumes that the development of the language faculty would take place if there were no requirement that legibility conditions be met (see figure 1). However, what would happen if the pool contained some rocks that broke the water’s surface? The expansion of the ripples would remain perfectly formed until they met with the edge of the rocks, and then the shape would become irregular, depending upon the shape of the rock (see figure 2). Of course, the rocks in this analogy are the performance systems. As with the ripples, when the language faculty interacts with these performance systems, its surface manifestation changes because it is forming on the basis of different criteria. However, the important point is that we assume that the development of the faculty itself begins from perfection and when it deviates from this, provided that we know the factors of variation, it should be predictable.

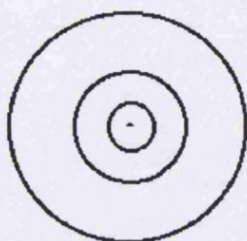


figure1

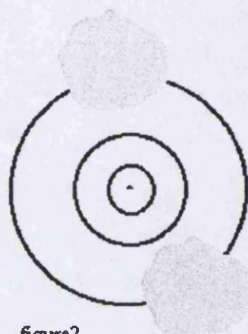


figure2

Of course, we don't know exactly what the factors of variation are (or at least their nature), but this is the starting point of the minimalist endeavour.

1.2.1 The components of the language faculty

Now let's consider the main components of the language faculty. It minimally consists of a lexicon and a computational system (the computational system for human language (CHL)). The lexicon specifies the elements that CHL selects and integrates to form the linguistic expressions which are interpreted at the interfaces. The CHL is embedded within two performance systems; the articulatory-perceptual and the conceptual-intentional systems. Two linguistic levels are postulated as interfaces with the performance systems; logical form (LF) and phonological form (PF). The CHL maps a given lexical array (the numeration) to a pair of representations (π , a PF representation and λ , an LF representation).

A computation is said to converge at the interface if its structural description contains only legitimate PF and LF objects. When this is the case, it satisfies full interpretation (FI), a condition which requires that every entity that reaches the interface is interpretable at that level.

The derivation of a sentence, therefore, is the course it must take from the numeration to produce the pair of representations π and λ . The process of this derivation requires the application of a number of operations, the first of which is *Select*. *Select* is the operation which removes a lexical item L from the numeration and introduces it into the derivation. At this point, L becomes a *syntactic object* (if only because it is now in the syntax). Each time a lexical item is selected from N , its index is reduced by one. Once in

the syntax, the CHL recursively constructs syntactic objects by applying a second operation, *Merge*, which takes a pair of syntactic objects L and an object already formed in the syntax L_i and, by combining the two, constructs a new object L_{ii} . Select and Merge must be applied often enough to exhaust N and yield a single syntactic object. This forms the basic structure-building component of the grammar.

However, minimalist language design postulates a third syntactic operation, *Move*. Once Select and Merge have applied, Move furthers the derivation by copying an already formed syntactic object and Merging it in a new position. This has the effect of forming a *chain* that comprises the copy and the original syntactic object (the trace or another copy).

While both Select and Merge are assumed to satisfy virtual conceptual necessity, by virtue of the fact that without them there could be no derivations, Move does not. In the 1995 version of the Minimalist Program¹, movement is seen as a basic imperfection in the system. But if this is so, why does movement occur? Chomsky (1995) assumes that movement is driven by morphological requirements to *check* certain features. Checking is the process through which uninterpretable features are eliminated from the derivation. Before a feature can be checked, it needs to enter an appropriate configuration with a matching feature. The checking domain of a feature α is defined as follows;

Let H be a functional head dominating α . The checking domain of α consists of;

- a. X adjoined to H and any features dominated by X .
- b. any XP in Spec H , and any features dominated by X .

(See Chomsky, 1995: 255, 268)

The definition of a checking relation is given in 1 below:

- 1 α_i enters a checking relation with α_{ii} iff α_{ii} is in the checking domain of α_i , and α_i is deleted.

Note the presupposition of this definition that deletion is always under identity, so that α_i will only delete if it is identical to α_{ii} .

The interpretability of a feature is determined on the basis of interface conditions. As mentioned above, the principle of Full Interpretation states that no uninterpretable

features can remain once the derivation reaches the interface levels and so they must be checked and eliminated before this point if the derivation is to *converge*.

Linguistic expressions are not simply defined as pairs (π, λ) formed by a convergent derivation and satisfying interface conditions, however. Minimalism requires that the computational process in the derivation of an expression must be optimal, in the sense that it must satisfy some general considerations of simplicity, referred to as 'economy principles'. There are three major economy principles which are applied in the 1995 version of the Minimalist Program: Last Resort, the Minimal Link Condition and Procrastinate.

Last Resort prohibits superfluous steps in a derivation, requiring that every operation applies for a reason, namely to satisfy a checking requirement. The Minimal Link Condition imposes locality restrictions on movement operations, by requiring that each movement be as short as possible. Finally, Procrastinate delays the application of movement until after a point in the derivation called Spell-out. This is the point at which the course of the derivation splits, one part towards PF and the other to LF. Accordingly, it is assumed that operations which occur after this point will only have an effect on one of the two interface levels depending upon the level of the derivation in which it is applied. Procrastinate marks the cost distinction which is assumed to distinguish the two stages of the derivation. Post Spell-out movement is assumed to be cheaper because there is no requirement to displace the entire lexical item. Rather, only the relevant features which require checking, by virtue of the uninterpretability, need to raise. The implication of this is that movement may involve the displacement of only a single feature when it takes place post spell-out.

The introduction of these economy considerations is very significant. If we consider all of the possible derivations arising from a numeration, not only do we have the set of convergent derivations which satisfy the requirements of the interfaces, but also we impose the requirement that the path to convergency be optimal.

1.3 Organisation of the thesis

The major proposals of this thesis are as follows:

¹Though not in the most recent versions, see Chomsky, 2001

SLI children's deficit is far broader than has traditionally been assumed, and is constrained in principled ways according to the following three generalisations:

Generalisation 1: SLI children's deficit relates to both their productive and receptive abilities.

Generalisation 2: SLI children's errors are uni-directional in their nature.

Generalisation 3: The SLI child's language shows true optionality.

I suggest that, from this, we can propose an explanatory account based upon the idea that the optional omission of obligatory elements in SLI children's language reflects a deficit in their computational system which gives rise to two conflicting grammars, each specifying a different optimal derivation from the set of convergent derivations arising from a single numeration. I will demonstrate, on the basis of existing evidence and novel research findings, that the predictions of these proposals are supported.

The remaining chapters of this thesis are organised as follows;

In Chapter 2, I begin by considering how SLI children's deficit can be characterised. My discussion is restricted to a sub-group of the SLI population whose difficulties are limited to their grammar. This sub-group of children, who suffer from Grammatical SLI (G-SLI), have been identified in the work of Heather van der Lely and her colleagues (cf. Van der Lely & Stollwerck, 1997). I examine the different domains of the children's deficit and crucially argue that it extends significantly beyond inflectional morphology. I cite evidence from a variety of domains which point to a far more fundamental deficit than has traditionally been proposed, and argue in favour of the wider deficit which is advocated in the work of researchers like Heather van der Lely.

As well as examining the locus of the children's difficulty, I also consider the form of their deficit. I argue that the nature and variation of the children's difficulties are quite restrictive and propose three generalisations which hold for the children's language (see 1, 2 and 3, above). These generalisations are developed further and I consider their implications for our understanding of the children's deficit. In addition, I consider a number of possible counter-examples to the generalisations and how to account for them. Finally, from this basis, I formulate an explanatory account of the disorder.

In Chapter 3, I present the findings from five experimental studies. Each of these experiments has been designed to consider some aspect of SLI children's ability to use

syntactic negation. The experiments differ not only on the type of negative constructions examined but also on the modality of the abilities (i.e. receptive or expressive). In each case, I present a detailed statistical analysis of the SLI children's performance as compared to four control groups matched on the basis of various language and cognitive abilities.

In Chapter 4, I begin by extending the explanatory account proposed at the end of Chapter 2. I consider in detail the implications of the findings reported in Chapter 3, and modify my analysis on this basis. Then I examine in more detail the theoretical status of my proposals, particularly considering some of the assumptions I need to make in order to maintain my stance. I argue for a number of departures from the 1995 version of the minimalist framework and attempt to motivate these in principled ways.

I then move on to consider some of the most recent developments in the Minimalist Program (outlined in Chomsky, 1998,99), highlighting the significant impact which the fundamental changes proposed in these versions have on my proposals. After outlining these developments, I propose a new version of the account which successfully accommodates these changes while building upon my earlier proposals and findings.

Finally, in Chapter 5, I conclude the thesis by summarising and evaluating the developments I have proposed. I consider some of the major questions which remain for SLI research and suggest how one might go about exploring some of these questions in future work.

Chapter 2

2.1 The nature of SLI

SLI is a developmental disorder which affects language acquisition in children. It is characterised by severe problems in the development of linguistic comprehension and expression even though the putative prerequisite abilities in the areas of hearing, cognition, psycho-social development and neuro-motor functioning, seem to be in place (Menyuk, 1964). In the next few subsections, I will review some of the key characteristics of SLI in an attempt to lay some of the foundations for the discussion to follow. I'll start with the clinical definition of the disorder.

2.1.1 Clinical definition.

Before the term SLI can apply to a child, a range of criteria need to be considered. Firstly, the child must present with a severe language deficit. Many studies of SLI employ standardised testing to assess a child's linguistic abilities, with most speech-language pathologists agreeing that a composite score (based on performance over a variety of tests) corresponding to at least 1.25 standard deviations below the mean is indicative of a pathological language disorder (cf. Records and Tomblin, 1994). In addition, since the use of composite scores allows for significant variation in the subtests, some studies add the additional requirement that at least a mild deficit be apparent in both production and comprehension (cf. Stark & Tallal, 1988; Rice & Oetting, 1993).

In addition to the child's language deficit, a range of exclusionary criteria also apply. Most importantly, the non-verbal IQ of a child must be within age appropriate levels, usually defined as a non-verbal IQ of at least 85 (corresponding to less than 1 standard deviation below the mean) with no upper limit applying. Normal levels of hearing are assessed through a process of hearing screening. Typically, this requires the child to detect pure tones presented at 20dB in each ear at frequencies of 500, 1000, 2000 and 4000 Hz. The child must present with no evidence of any neurological dysfunction that may be related to their language deficit. This includes evidence of focal brain lesions, traumatic brain injury, cerebral palsy, or seizure disorders. Oral structure and function abnormalities, which might impede normal production, must also be excluded. Finally, a

normal social and affective status must be established. The child must display none of the symptoms of impaired reciprocal social interaction or restrictions of activities listed in the DSM-IV criteria for autism.

2.1.2 Prevalence of SLI

Estimates of SLI's prevalence are varied. However, as an example, in a recent study Bruce Tomblin of the University of Iowa examined a large sample of some six thousand 5 year old children (Tomblin, 1996a, b). The children were classified as showing signs of SLI if they scored at least 1.25 standard deviations below the mean on two or more of Tomblin's five language measures (1 vocabulary, 2 grammar, 3 narratives, 4 comprehension, 5 production), whilst holding to the exclusionary criteria mentioned above. Tomblin's study revealed a prevalence for SLI of around 7.4% in his sample. If we take the full range of studies into account Tomblin's figure is conservative, but still striking.

2.1.3 The genetics of SLI

The familial aggregation of SLI indicates that the disorder may have a genetic basis. Perhaps the most influential series of studies investigating this phenomenon focused upon the KE family, whose language abilities were investigated by a number of research teams (cf. Gopnik, 1990a, 1991, 1994; Hurst, 1990; Vargha-Khadem, 1995). In the case of the KE family some 16 members of the tri-generational family have been diagnosed as having some form of language disorder (see figure 1)

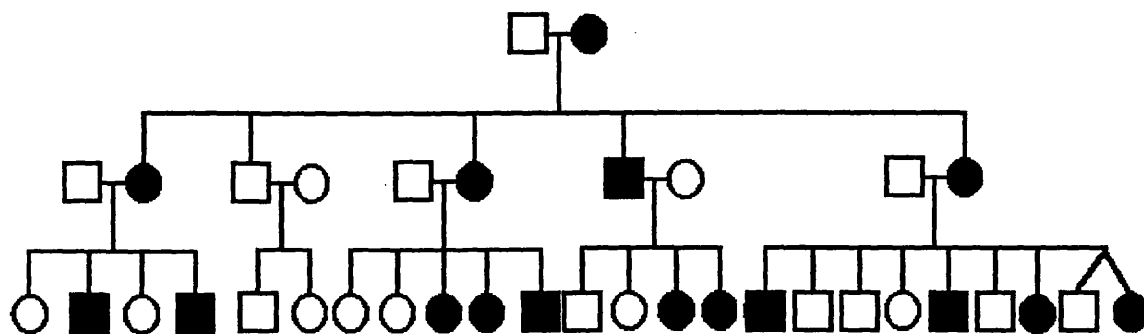


Figure 1. Pedigree of the KE family adapted from Gopnik (1994): squares = males, circles = females, shaded symbols = impaired language.

In the study conducted by Gopnik and Crago (1991), the language abilities of 20 members of the family were tested. The findings from the study indicated that the linguistic environment of the individuals was not a significant factor in predicting the occurrence of impairment. Of the 20 members they examined, 13 were found to have impaired linguistic abilities while the other 7 were acquiring and using language normally, despite sharing similar linguistic environments.

Findings from the KE family are not the only evidence for familial aggregation. In a later study, Tomblin (1996) examined a sample of 44 SLI subjects, and their first degree family members. He found that around 21% of family members had language difficulties, although the distribution across the sample was somewhat heterogeneous. Another study, by Tallal et al. (1991), reported an even higher proportion of affected family members. Some 65% of their SLI sample had parents with histories of speech, language, or reading problems. These findings appear to indicate that there is a far higher probability that a child will suffer language difficulties if their parents or siblings do as well (compare 7.4% for the overall population with 21% for families with existing impairment). However, despite the findings from the KE family, many have suggested, quite reasonably, that a child brought up in an impaired linguistic environment is bound to suffer linguistic difficulties. In order to tackle this issue, a number of researchers have conducted twin studies in order to isolate as many environmental influences as possible. The focus of many twin studies has been the proportion of SLI's concordance in monozygotic (MZ) and dizygotic (DZ) twin pairs. Given that the twins have almost identical linguistic environments, the only variable is their zygosity. The hope was that if a clear distinction could be found between twin pairs of different zygosity, then a genetic link could be proven. Overall, the findings were promising. MZ twins have a significantly higher proportion of concordance for SLI than do the DZ twins (see table 1)

Table 1.

Study	Zygosity	
	MZ	DZ
Lewis & Thompson	86%	48%
Bishop	66%	42%
Tomblin	62%	37%

However, while these findings seem to indicate that there is a strong genetic influence on SLI, quite a large proportion of the MZ siblings do not share SLI. Tomblin and Birdwater (1994) suggest a possible explanation for this variation. They propose that there may simply be a genetic 'predisposition' to SLI, and that this would hold in all MZ cases, but there is an incomplete penetrance of the SLI genotype. What this means is that while both twins share the same tendency toward SLI there must be a range of other factors which contribute to the occurrence of the disorder. Only a child whose language development is influenced by a sufficient number of these factors will have the impairment.

This proposal seems sensible. While we can reject the null hypothesis that SLI occurs randomly among children, the disorder's apparent genetic aetiology seems also to be influenced by a number of additional non genetic factors which may either increase or, alternatively, reduce the penetrance of the genotype.

2.1.4 The neurobiology of SLI

Advances in neuro-imaging techniques such as magnetic resonance imaging (MRI) have enabled researchers to examine hypotheses concerned with abnormalities in basic brain structure. These investigations have pursued the possibility that there may be neuroanatomical correlates of SLI. Some of the most valuable research in this direction comes from the series of studies conducted by Elena Plante and her colleagues. She was following the work on developmental dyslexia of Galaburda et al. (1985), who discovered a range of structural anomalies accompanied by an atypical symmetry of the plan temporale.

Typically, the perisylvian area shows an asymmetry, in which the left hemisphere exceeds the right in size. However, in the Galaburda et al. study it was found that the developmental dyslexics had an enlarged right planum temporale, approximating the left in size. Plante pursued the possibility that a similar correlate may exist for SLI by examining the perisylvian area (including the plana temporale see fig.3) from the MRI scans of language impaired individuals, an approach called morphometric analysis.

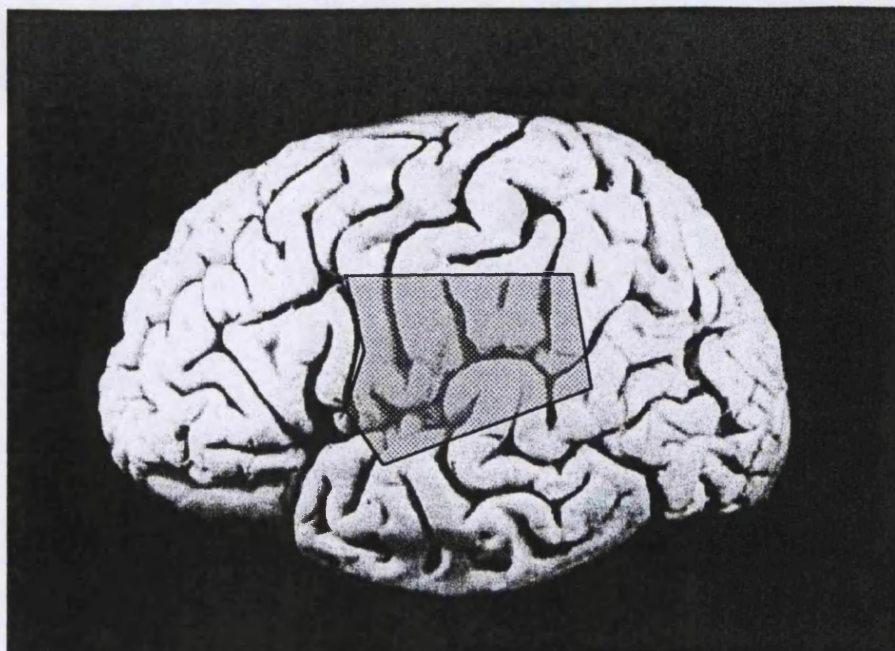


Figure 3. The left hemisphere of the brain with the perisylvian area highlighted.

In one of the earliest of these studies, Plante et al. (1989), tested an SLI boy (age 4;9) and his normal development DZ twin. MRI revealed that the SLI child had a left/right perisylvian symmetry, similar to that found in the Galaburda study. However, an abnormal configuration was also found in the unimpaired twin. In this case, it was the opposite of the typical finding, with the right perisylvian area exceeding the left in size.

Plante et al. (1991) extended the study, examining 8 SLI children (aged 4;2 - 9;6). Of these, 6 were found to be atypical with 3 showing symmetrical perisylvian areas and 3 showing larger right perisylvian areas. She also examined the MRIs from the parents and siblings of 4 of the SLI children (Plante, 1991) revealing that 7 of the 8 parents and 4 of the 5 siblings had atypical configurations with no apparent correspondence between this and language difficulties. Plante's findings suggest that an enlarged right perisylvian area may be indicative of a condition which disfavours normal language development. However, any strong conclusions arising from these findings must be tempered somewhat.

The occurrence of atypical perisylvian configurations with normal language development, and vice versa, indicates that, as with familial aggregation, although this form of structural anomaly concurs with an increased risk of language difficulties, it is by

no means a certain predictor of them. In addition, a number of researchers have suggested an alternative analysis of these findings. John Locke (1994), for example, has suggested that these structural anomalies may be the product of the disorder, rather than its cause. Locke argues that neurodevelopmental difficulties in the left hemisphere might result in language learning through right hemispheric mechanisms which, in turn, may alter the child's neuro-anatomy as observed. There is evidence that the lateralisation of language functions can change, particularly following early brain trauma (cf. Lenneberg, 1964) and much work on the critical period hypothesis presupposes that post critical period language learning (or L2 acquisition) is the product of right hemispheric mechanisms. However, there is little evidence that this can promote any change in basic brain structure. Additionally, Plante (1996) reports that left-right perisylvian ratios are quite stable across time which argues against the view that the anomaly could be the product of postnatal learning.

Parallels with the findings from studies into the genetic basis of SLI are valuable. The pattern of incomplete penetrance continues here. It seems likely that there are a number of contributory factors to SLI. However, much work still needs to be done before we can identify these factors and their importance in SLI's aetiology. This task is made even more difficult by the heterogeneity of the disorder, the topic of the next section.

2.1.5 Subgroups of SLI

Establishing an accurate phenotype of SLI encounters a number of difficulties. Despite the relatively strict criteria on which it is defined, within the group of SLI children, potentially important differences exist. Primarily because of the composite nature of SLI's clinical definition, an SLI child may present with a variety of different primary characteristics. Aram & Nation (1975), for example, examined a large group of SLI children, identifying no less than six distinct patterns, varying both on the range of elements affected and the primary deficit.

This potential for heterogeneity has led many researchers to attempt to identify subgroups of the disorder, with several relatively homogeneous groups of children emerging. One of the most notable and well defined of these is the Grammatical SLI group (G-SLI), established in the work of Heather van der Lely and her colleagues (cf.

van der Lely & Stollwerck, 1996). Grammatical SLI children have a disproportionately severe grammatical deficit coupled with relatively unaffected performance on tests of phonology and pragmatic knowledge. Van der Lely (1997, 98) gives a detailed description of the subgroup and provides an illustrative case-study of one of her G-SLI group, AZ. The case study focuses upon a series of tests conducted when AZ was between the ages of 10 and 12 years. He had no phonological impairment in his expressive speech and scored in the top 10% on standardised non-verbal tasks. On tests of morphosyntactic abilities, his score was similar to that of children aged 5;9. His vocabulary was a little better, similar to an older control group aged around 7. He encountered severe difficulties with tests designed to elicit inflectional morphology and judgements on verbal inflections. Van der Lely notes that AZ's utterances were restricted to a low level of syntactic complexity and, when his understanding of binding principles was assessed, he experienced difficulties when he could not use non-syntactic cues such as gender to guide his performance.

In contrast to his grammatical deficit, AZ had no difficulty with tests of pragmatic knowledge which required him to detect the violation of conversational maxims. He performed at an appropriate level, relative to his chronological age, on tests of verbal reasoning and non-verbal tests of transitive inference and, when his auditory abilities were tested, he showed normal performance on temporal order judgement and backward masking (Rosen, van der Lely and Dry, 1997).

The development of this form of subgroup constitutes an important advance in SLI research. SLI in its broad definition is a group in which potentially important differences exist, and performance means from such a diverse group may obscure potentially important findings and may misrepresent SLI children as a whole.

In this study, I will examine a group of G-SLI children. As such, my focus will be restricted to the characterisation of SLI children's grammatical abilities, putting to one side the broader linguistic characterisation of the disorder. In the next section, I will begin to detail these grammatical abilities.

2.2 Characterising SLI: the grammatical deficit.

2.2.1 Morphology

Morphology is widely recognised as an area of particular weakness for SLI children (cf. Bishop, 1994). It has been extensively studied and documented over the past 30 year by a large number of researchers. Adopting a methodology introduced by Morehead and Ingram (1975), which employs language matched control groups (as opposed to chronologically matched groups) as comparisons, various elements of grammatical morphology have been identified as being particular loci of difficulty. That is, areas where the children's problems go beyond the more typical linguistic delay which characterises the population.

Evidence from studies of English speaking SLI children suggest that particularly problematic forms include past tense *-ed*, 3rd person singular *-s*, progressive *-ing*, infinitival *to*, auxiliary and copular *be* and auxiliary *do* (not an exhaustive list). See 1 for examples of morphological omission errors:

1.
 - i. *Those girl have long hair (plural *-s*)
 - ii. * John like ice cream (third person singular *-s*)
 - iii. *I've got John ball (genitive *'s*)
 - iv. *She has cook the dinner (past participle *-ed*)
 - v. *He's still run over the hill (progressive *-ing*)
 - vi. *What he eating (auxiliary *be*)
 - vii. *She happy (copula *be*)
 - viii. *What he not eat? (auxiliary *do*)

A study conducted by Rice, Wexler & Cleave (1995) is a good example of research into the children's morphological deficit. They examined SLI children's use of a number of grammatical morphemes, including 3rd person singular *-s*, past tense *-ed* and auxiliary *be* and *do*. To give an idea of the children's abilities in this domain, I'll briefly summarise their findings.

They examined a clinically identified group of SLI children with a mean age of around 5 years. These were subsequently matched to two control groups on the basis of chronological age and Mean Length of Utterance (MLU). The MLU group were aged

around 3 years. The children's ability to use the target morphemes was evaluated on the basis of transcripts taken from their spontaneous speech, in addition to a series of probe tasks which directly elicited the morphemes.

Rice et al. found that the SLI children consistently failed to produce the obligatory morphological material and that their performance was significantly below that of either of the two control groups. Their findings are represented in table 2 below.

	SLI	LA	CA
-s	30	45	90
-ed	23	53	90
be	45	65	99
do	46	62	98

Table 2: Percentage correct in obligatory contexts (from Rice et al., 1995)

Rice et al's study typically found that errors generally take the form of omissions of obligatory elements, while their commission in inappropriate contexts is not found. They note that, when the SLI children use the problematic forms, they are appropriate, concluding that when these forms are inserted, their use appears to be constrained in the same way as in adult production. Further, their findings suggest that these problematic forms seem to be optional for the SLI child. Both of these observations about the general nature of SLI children's language are very significant and I'll return to them in the discussion below.

2.2.2 Errors of syntactic structure

In addition to a morphological impairment, SLI children encounter a number of further difficulties. One of the most striking aspects of SLI children's language relates to the syntactic simplicity of their utterances. Van der Lely (1997) examined the production of a number of constructions which varied in their syntactic complexity. In her data sample, she reported an almost complete lack of complex NPs or structures involving NP embedding. Further investigations revealed that, if pragmatically forced, the SLI children could produce embedded structures, but they suffered increasing difficulty as a function of the structural complexity of the target form. Two earlier studies, conducted by Morehead and Ingram (1970, 73), support these findings. They report that while all major

syntactic categories are present in their SLI sample, the range of contexts in which they are used is far less varied when compared to the samples from language matched (MLU) controls.

As well as suffering problems with the production of complex derivations, a number of studies report that their interpretation can be problematic for SLI children. Bishop's 1979 study is an early example. She examined a group of SLI children's ability to correctly interpret a number of aspects of grammar. She found that the SLI children's performance was significantly below that of her chronologically matched controls. However, when comparing the performance of her SLI group with a language matched control group (matched on tests of vocabulary), she found that the differences only achieved significance on one of the experimental items. This was the item which assessed the interpretation of reversible passive constructions, such as, *the dog is chased by the cat*.

In a later study, van der Lely and Harris (1990) examined the interpretation of both the reversible active and passive forms. Their findings indicated that the SLI children were performing significantly worse on both constructions when this was compared to both age and language matched controls. Van der Lely and Harris suggest that a possible explanation for these findings might be that the SLI children had difficulty assigning θ -roles on the basis of syntactic structure alone and that, as a result, when the order of arguments in a structure changes, θ -role assignment becomes difficult. This interpretation is supported by findings from another study conducted by van der Lely (van der Lely, 1996), in which she observed that SLI children were far more likely than control children to give an adjectival interpretation when the prepositional phrase was absent from a reversible passive, as in 2. Although this interpretation is not incorrect, van der Lely suggests that it is indicative of the SLI children's tendency to avoid a passive interpretation.

2 The fish is eaten.

Another area of difficulty highlighted by van der Lely's research is reference assignment to pronouns and anaphors. Van der Lely and Stollwerck examined this aspect of SLI children's comprehension in their 1997 study. Their findings indicated that the

children optionally accepted non-local antecedents for reflexive anaphors (see 3a) and local antecedents for pronouns (see 3b) when the determination of reference was dependant upon syntactic information alone.

- 3 a. Simon saw the bear looking at himself (interpreted with 'himself' referring to Simon)
 b. Simon saw the bear looking at him (interpreted with 'him' referring to the bear)

Their analysis of this finding was that Binding Principles (Chomsky, 1986) were not available to SLI children. While the optionality of the children's interpretation makes this analysis unlikely, the findings do seem to indicate that SLI children have a general difficulty forming structural dependencies and relations.

2.2.3 Wh-questions

The conclusions from the last section are further supported by studies that have examined SLI children's formation of wh-questions. A number of studies report SLI children's severe difficulties in this domain. A recent example is van der Lely and Battell (1996), who examined the use of a range of wh-constructions, reporting difficulties in a number of areas. First, with respect to the process of subject-auxiliary inversion, they found that the SLI children optionally allowed the auxiliary to remain in situ (as in 4a) omitting the normally obligatory I-C movement required in ND (normally developing) production. In addition they found that, in constructions where do-support was required, the children optionally omitted the aux-element (as in 4b);

- 4 a. *What he is doing?
 b. *What he doing?

This finding is also reported in an earlier study (Leonard, 1995) which found that the SLI children sampled failed to invert the auxiliary significantly more times than either the age matched or language matched control groups.

Van der Lely and Battell (1996) also observed significant problems with the process of wh-movement. They found that, although the wh-element always surfaced in

the correct sentence initial position, the child often inserted an extra argument in the gap which is assumed to be the origin of the wh-element in ND production (see 5).

5 What is the clown doing something?

Van der Lely and Battell argue that this form of error indicates that the correct position of the wh-element is not the result of its derivation through movement, but rather it must have been merged in the surface position, otherwise the trace of the wh-element would block the insertion of the second argument internal to the VP. In addition, the apparent violation of the theta criterion which this represents indicates that, in these examples, the wh-element is not fulfilling a thematic role. It appears that the emergence of a sentence initial wh-element is the result of a compensatory strategy dependent upon non-linguistic cues. This is not to suggest that wh-movement never occurs. In the SLI children's derivation of a wh-question, they clearly produce grammatical forms with no additional arguments. However, this evidence clearly suggests that some process is open to optionality.

Finally, van der Lely and Battell noted a striking asymmetry when they considered the variable of question type. They reported that while the SLI children produced some 77% of their subject questions correctly, they only managed to produce 16% of their object questions correctly. This asymmetry appears to be linked to the additional complexities involved in the derivation of object questions. Further analysis of the data sample appears to support this view, with the finding that individual types of errors, where comparable, appear equally across the question types. The significant variable is just the number of potential errors that can occur.

2.2.4 Case

A number of studies have examined SLI children's ability to assign structural Case (cf. Menyuk, 1964; Loeb and Leonard, 1991; and Rice, Wexler and Schutze, 1999). They all report significant difficulties in this domain, with children found to regularly substitute inappropriate Case forms in their productive language, as exemplified in 6;

6 *Him eating popcorn.

One of the most recent studies to examine this domain is Rice et al., 1999. While they report the usual difficulties with Case assignment, they note some interesting patterns in the distribution of the children's errors. Most strikingly, they note that the substitution errors appear to be limited to the specification of subject Case, finding very few errors involving the inappropriate use of nominative forms in accusative contexts. Rice et al. address the question of how this asymmetry can be explained by hypothesising that the SLI children are applying a default strategy whenever the syntax does not provide a Case specification and that the apparent absence of object Case errors is an artifact of this. Put simply, Rice et al propose that the children possess a default Case specification which they apply whenever the syntax fails to assign a Case value. In English, the default value is assumed to be accusative. This accounts for the skewed distribution of the errors; when the syntax fails to assign nominative Case this is replaced by accusative. However, when the syntax fails to assign accusative, the default strategy assigns accusative and it appears that there is no Case error.

This would seem to be a logical solution. It would be relatively unprincipled to suggest that one Case value was subject to substitution and not another, and here Rice et al. are able to maintain the view that all Case assignment is subject to the child's deficit, but that since accusative is the default value, the effect is obscured.

Rice et al. note that similar findings are observed in ND children when they are in the Optional Infinitive (OI) stage, though they hypothesise that these problems are prolonged in SLI children's linguistic development. They also note that the value of the default may be subject to cross-linguistic variation, suggesting that in languages like French, the default value appears to be nominative.

2.3 Accounts of SLI

In this section I will briefly outline and evaluate some of the leading accounts of SLI children's deficit. I will begin by looking at Leonard's processing account of SLI and then move on to examine some of the purely linguistic accounts.

2.3.1 Processing accounts: The surface hypothesis and the sparse morphology hypothesis.

The surface hypothesis and sparse morphology hypotheses have been developed in the work of Leonard and his colleagues. The surface hypothesis is based upon Leonard's adaptation of Pinker's (1984) learnability model. Under this view, the learning of morphology involves completing a morphological paradigm. The order in which individual morphological elements are acquired relates directly to their phonetic substance (in addition to a number of other factors). Under Leonard's definition, the level of phonetic substance is based upon factors such as stress, frequency, obligatoriness and syllabic structure. He suggests that elements which are low in phonetic substance are acquired last and will be omitted most frequently from SLI children's production. According to the surface hypothesis, the omissions which characterise SLI children's speech are related to the SLI child's reduced processing capacity.

Leonard (1992, 1995), taking into account data from a variety of other languages, develops the general ideas of his earlier proposals to form the sparse morphology hypothesis. He notes that the domains and range of difficulties suffered by SLI children vary across languages. In an attempt to account for this, he utilises Bates and MacWhinney's (B&M) idea that the cues for matching 'basic functions' to surface representations may vary cross-linguistically. B&M suggest that these cues may take a variety of forms, including lexemes, word order and morphology, and that the specifics of each system are based upon the characteristics of the particular language being acquired. Leonard proposes that, in languages such as English, which possess a relatively impoverished morphological system, other factors such as word order become more significant in the acquisition process. As a result, Leonard argues, English speaking children pay far less attention to morphology and these elements should become vulnerable to omission in the speech of children with a reduced processing capacity, such as that in SLI.

Conversely, if we consider a language like Italian, which is rich in morphological structure, B&M would predict that morphology would constitute an extremely significant cue to acquisition. Accordingly, Leonard proposes that morphological omissions should be less frequent in Italian, with other elements bearing the brunt of the child's reduced processing capacity.

Comparative studies of English, Italian and Hebrew children (Leonard et al. 1992) appear to support these predictions. The English SLI children produced only a relatively small proportion of their obligatory morphological elements when compared to their MLU matched controls. Comparison with the data from the Italian children did not reveal the same difficulty in this domain but, instead, revealed a severe deficit with respect to the production of free standing articles when compared to the performance of MLU controls. The data from Hebrew speaking SLI children also failed to demonstrate a comparable morphological deficit. The locus of the children's deficit in this study was found to be with the prefixal and free standing definite markers and the syllables needed to form the pattern of the verb.

Leonard's proposals link SLI children's difficulties to processing considerations, rather than assuming a deficiency in the grammar. Combining the proposed effects of the surface characteristics of morphological elements with Pinker's model of paradigm building, he presents a relatively non-modular view of the disorder, linking grammatical symptoms to a perceptual deficit.

The two hypotheses are complementary in their predictions. While the surface hypothesis implies that cross-linguistic differences should be anticipated, the Sparse morphology hypothesis makes explicit predictions regarding the nature of these differences. In turn, the sparse morphology hypothesis does not make intra-linguistic predictions per se. It is limited to the explanation of why certain linguistic devices present children from one language background with more difficulties than others.

Given the halting and effortful nature of SLI children's speech, a processing account along these lines might seem the most intuitive explanation of the disorder. However, there are a number of potential difficulties, which we will briefly consider.

Firstly, a point made by Gopnik and Goad (1994) in relation to Leonard's hypothesis is why perceptual properties should be related to processing at all, given that perception involves correctly registering information, while processing relates to operations upon information that has already been registered. As Leonard (1998) notes, this question relates to a central assumption of his hypothesis, that already perceived information can be lost when processing demands are too high:

“given the reduced speed of processing assumed for children with SLI, sufficient processing of one item can’t be completed before the next item appears. Consequently, some material is processed incompletely or not at all. In a language like English, it is reasonable to expect that if an inflected word is incompletely processed, only the bare stem will be retained” (Leonard, 1998; p. 251)

Leonard’s position seems to be that, even after all the information has been perceived, if constraints prevent a word from being fully processed the bare stem will surface.

Another potential problem for Leonard’s account is the observation that Case errors are characteristic of SLI children’s speech. Given Leonard’s hypothesis, there does not appear to be a theory-internal reason to expect these types of errors or a way of explaining their distribution (see section 2.4). Leonard’s position on this problem and problems of this sort is that they don’t necessarily constitute a major difficulty for his hypothesis. Rather, he suggests that they are merely indications that the account may be incomplete.

It is true that few accounts predict the type of substitution errors found in Case errors. As was discussed, their occurrence seems to be restricted to a few specific domains. An analysis of Case errors such as that proposed by Schutze and Wexler (1996), which argues that the patterning of Case error is the product of a default strategy, and which presumably specifies accusative as the default Case in English, would be relatively parsimonious with Leonard’s hypothesis. However, Leonard notes that this is a problem that requires attention.

The final difficulty I’ll consider is more serious. It relates to the discrepancy observed in plural *-s* and third person singular *-s* forms. Since these inflectional elements are phonetically identical, the surface hypothesis would predict that, all things being equal, the SLI child would perform similarly on both. Data which was reported by Rice and Oetting (1993), however, suggests that this is not the case. They examined SLI children’s production of both these forms. They found that while the SLI children’s

performance on third person singular *-s* was significantly below that of their MLU matched controls, the difference on plural *-s* forms did not achieve significance.

Leonard points out that the differences in the SLI children's performance on these two morphemes could be explained by the fact that the plural *-s* morpheme is acquired earlier than third person singular *-s*. While this is true, Rice and Oetting's findings do not support this analysis. When they considered the MLUs of children who were performing below the normal level on plural *-s*, they found no difference when compared to similarly matched controls. This suggests that the SLI children's performance on plural *-s* was never below that of comparable ND children, as the surface hypothesis would predict. A point which Leonard (1998) concedes.

Obviously this data is tentative. However, if these conclusions are correct, then we have isolated a dissociation between two morphological elements which differ only on the basis of their grammatical role, suggesting that SLI children's difficulties must, at least in part, be related to this domain. In the next subsection I consider some accounts that assume this sort of specifically grammatical deficit.

2.3.2 Grammatical accounts of SLI

In this sub-section I'll describe and evaluate a number of accounts which locate SLI children's deficit in the domain of grammar. These fall broadly into two groups. First are the accounts which only assume a morphological deficit, as did Leonard, and second are the accounts which assume a much wider deficit relating to the structural processes of the computational system of language.

2.3.2.1 Accounts of the morphological deficit

2.3.2.1.1 The Rule Formation Deficit account (Gopnik, 1990)

Gopnik and her colleagues have formulated a structural account of SLI. The Rule Formation Deficit account (cf. Gopnik and Crago 1991) can be seen as a development of the earlier Missing Feature account (Gopnik, 1990) which suggested that the nature of SLI children's deficit related to the subject's syntactic-semantic features. It was argued that these elements are absent from the underlying representations of the structures produced by the SLI child's grammar. As a result, the phonological realisation of these

features, the inflectional morphology, is predicted to be absent from the SLI children's production².

In more recent statements of the account (Ullman & Gopnik 1997), the deficit is viewed as an inability to formulate the implicit grammatical rules which, in syntactic theories such as Minimalism, are taken to involve the interpretation of these elements (the Rule Deficit account). The proposed deficit with respect to the child's rule-building ability is seen as resulting from the absence of the formal features. Ullman and Gopnik, taking on the view developed in the work of Pinker and Prince (1988,92), that distinct mechanisms underlie regular and irregular morphology, argue that, as a result of the inability to formulate the grammatical structure underlying regular morphology, these forms will be stored in the associative memory as, it is argued, are the irregular forms. Therefore, Ullman and Gopnik propose that the proportion of inflected forms which are attested in the SLI children's production are merely a reflection of this compensatory strategy, rather than of any underlying grammatical knowledge.

Evidence which has been taken to support Gopnik and colleagues' proposals comes from a number of studies. For example, Gillon and Gopnik (1994) investigated SLI children's production of grammatical number; their findings revealed a significant deficit with respect to the generalisation of plural forms, as well as with the ability to produce judgements of acceptability for nonce words. In addition, in a later study conducted by van der Lely and Ullman (1996,97), a significant frequency effect for both regular and irregular past tense forms was found for SLI children. This finding contrasted with the results from a language matched control group of younger, normally developing children who showed frequency effects for only the irregular morphological forms. This result is particularly significant since it would be a prediction of Gopnik and Ullman's proposal which suggests that, since irregular and regular forms are similarly stored in the SLI grammar, then both forms would display the frequency effect which is associated with irregular morphology in ND.

²Although it is noted that these forms are attested optionally in the data, it is argued that these correctly inflected surface forms are simply 'phonological variants' which have no underlying grammatical significance

Although there is compelling evidence to suggest that compensatory strategies involving the associative memory play a role in SLI production, the proposal as a whole encounters a number of difficulties.

The first of these relates to Gopnik's original proposal that SLI children's syntactico-semantic features are absent from their underlying grammar. Gopnik (1990) suggests that when morphological forms occur appropriately, these are just phonological variants with no underlying significance for the child. If this were the case, we would expect the child to over-produce morphology in a completely unconstrained way. However, evidence from a wide range of experimental studies suggests that this is not the case. Rather, SLI children's errors seem to be remarkably constrained. For example, errors seem to be limited to omissions of obligatory forms, and commissions, where an inappropriate form surfaces do not, on the whole, occur. This will be the focus of more detailed discussion in section 4.2.

In Gopnik's later proposals, she attempts to side-step this problem by allowing for the possibility that the use of morphology might be constrained by the application of explicitly learned strategies, such as those used in the acquisition of irregular morphology, or perhaps in an even cruder form i.e. 'add -ed for past tense'. However, here she encounters another empirical problem. SLI children's errors are not limited to a sub-set of lexical items or morphological forms. A single item is often *optionally* marked. This is in conflict with the predictions of Gopnik's proposal since she would expect that once an SLI child has explicitly 'acquired' a morphological form this should no longer be subject to optionality, as is the case with irregular morphology.

2.3.2.1.2 The Agreement Deficit Account (Clahsen 1989, 91)

The Agreement Deficit Account has been proposed in the work of Harald Clahsen (cf. Clahsen 1989, 91). Its central ideas were based upon a series of studies which investigated the linguistic abilities of German-speaking SLI children. The original proposal was formulated in the framework of generalised phrase structure grammar (GPSG), and links SLI children's difficulties to the formulation of agreement relations. Specifically, Clahsen proposed a selective impairment of the 'control agreement principle' (Gazdar et al, 1985), which refers to the semantic interpretation of local trees.

Clahsen noted that German-speaking SLI children frequently fail to mark agreement on verbal but not nominal elements. He suggested that this regularity in the distribution of the children's errors was a reflection of the asymmetrical relationship which GPSG assumes between functors and their controlling categories.

In later publications, Clahsen has reformulated his proposals within the Minimalist framework (Chomsky, 1993). Here, he relates the deficit to a sub-set of uninterpretable features. Clahsen assumes a relatively narrow view of the deficit, arguing that only the uninterpretable ϕ -features of verbs are affected (missing) in the SLI child's grammar.

Clahsen's proposals predict that SLI children will suffer difficulties with the specification of person and number on verbs, but not tense (tense being interpretable on V). Clahsen also argues that he can account for the observed dissociation between nominal and verbal elements, since the features which are problematic on the verb are interpretable on the noun.

An interesting aspect of Clahsen's proposal is his prediction that the specification of tense on verbs should be unaffected. He supports this claim by citing evidence from both German and English SLI studies. For his analysis of English, he combines the data sets from Goellner, 1995, on agreement (third person singular -s) and van der Lely and Ullman on tense marking. Clahsen notes that while the SLI children in Goellner's study successfully marked agreement only 47% of the time, van der Lely and Ullman's children managed to mark tense some 77% of the time. He argues that this confirms his assertion that SLI is primarily associated with a deficit in the child's agreement system.

Clahsen's relatively narrow characterisation of the disorder is dependant on this argument. However, it is flawed. Firstly, as van der Lely herself points out (van der Lely, 1998), the two data sets used in the analysis not only utilised different experimental techniques, but also different subject groups which were formulated upon different criteria. This in itself could be the cause of the variation. In addition, it is clear that, although there is a significant difference between the SLI children's performance on agreement and tense, there is also a significant difference between the children's performance and their controls' performance. In the case of the van der Lely and Ullman

study, the SLI children's performance was significantly worse than that of their control group.

Finally, Clahsen's account encounters the same difficulty that dogs the Rule Formation Deficit account. It proposes the complete absence of some portion of the grammar. As discussed in the previous sub-section, even the most severely affected aspects of the grammar are subject to optionality. If Clahsen attempts to attribute these occurrences to explicitly learned strategies, he faces a variety of empirical conflicts, as did Gopnik.

2.3.2.1.3 The Extended Optional Infinitive account (Rice et al., 1995)

Rice et al., 1995, propose the Extended Optional Infinitive (EOI) account of SLI. This characterises SLI as a prolonged period in which children consider the marking of tense and agreement in matrix clauses to be optional. The original idea was formulated by Ken Wexler (Wexler, 1994) as a stage in normal language development, called the optional infinitive stage (OI), in which children will fail to consistently mark tense in contexts where this is obligatorily required. Rice et al. (1995) noted a similar pattern of production in SLI children and hypothesised that the conceptual basis of the OI could be imported as an explanation for the difficulties experienced by SLI children, with the additional stipulation that this period be extended for some reason in SLI children's development.

In earlier formulations, various aetiologies were proposed for the children's deficit, many of which amounted to some form of underspecification of the tense projection or the features underlying tense morphology. However, in the most recent formulation of the account, the deficit is extended to incorporate the observed problems with agreement morphology (Wexler, 1998). Here a new explanation of the children's deficit is proposed. This takes the form of the Agreement and Tense Omission Model (ATOM). It is proposed that SLI children's deficit relates to a developmental principle, proposed by Wexler, called the Unique Checking Constraint (UCC). Basically, the UCC specifies that the D feature of a subject nominal can only check the corresponding D feature on one functional category. Wexler suggests that both the Agr and Tense projections carry an uninterpretable D feature which requires checking. As a result, the

SLI child is forced to discard one of them, and accordingly fails to specify it morphologically.

Wexler notes that, given the UCC, he should predict that either tense or agreement would always be unspecified on the verb: the child should never produce a fully specified sentence. However, he argues that this need not be the case. He argues that the UCC would hold only optionally for the SLI child, suggesting that certain 'interpretive/conceptual properties' which require the specification of Tense and agreement would optionally overrule the UCC, and in these cases the fully specified form should surface.

The EOI account, as it is formulated in Wexler, 1998, predicts that the SLI child will optionally omit tense and agreement morphology. In addition, because the Agr projection is assumed to be responsible for the process of Case assignment, a potential explanation for this aspect of SLI children's difficulties also emerges (cf. Schutze and Wexler 1996a, b).

Conceptually, I feel that this account encounters a number of difficulties, some of which I'll detail here.

The first of these relates to Wexler's stipulation that both the Agr and Tense projections carry uninterpretable D features. Although this is not problematic from a structural point of view, Wexler makes no attempt to independently justify such a stipulation: it is made simply to satisfy a requirement of his hypothesis. This is an inelegant aspect to the account.

Next, although Wexler, 1998, does not deal with cases where the SLI child has omitted both tense and agreement, he does acknowledge the existence of such forms in the SLI data. Schutze and Wexler, 1996 note production of this type in their data. For example consider the sentence in 7:

7 My cry [-TNS - AGR]

This type of production clearly represents a major problem for the 1998 formulation of the EOI. Clearly, if the principle which causes SLI children's difficulties specifies that checking can only take place once, then we would always expect one projection to be specified. This prediction is not supported empirically.

Finally, let's consider Wexler's specification of the UCC. I feel that it is a theoretically unattractive concept to propose that a computational constraint holds for a population with a developmental language disorder, but not the normal steady-state grammar. This is particularly problematic in Wexler's case because he suggests that SLI children's language represents a stage in normal language development. From an acquisitional point of view, if we take on board Wexler's assumption that the child is already aware of the requirement for tense and agreement specification (which are presumably encapsulated by the interpretative/conceptual properties) and that by conforming to the UCC they are violating these properties, then it would be difficult to imagine how a child would ever be able to discard such a constraint.

2.3.2.2 Broader deficit accounts

2.3.2.2.1 The Representational Deficit for Dependant Relations (RDDR, cf. van der Lely, 1996).

Van der Lely (cf. 1996) has proposed an account of SLI which relates the children's deficit to the building of 'non-elementary complex dependencies'. According to the most recent versions of her account, she defines non-elementary dependencies as those requiring the application of movement or checking operations (in the terms of Chomsky, 1995; see also Manzini and Roussou, 2000).

By relating SLI to movement/checking, van der Lely assumed a much wider characterisation of the disorder than had previously been adopted by competing accounts. In addition to problems with tense, agreement and Case, she predicts difficulties with transformational processes like *wh*-movement and subject-auxiliary inversion, as well as with thematic role and reference assignment to NPs, when this is dependant upon syntactic structure alone.

Van der Lely's wider characterisation of SLI corresponds to the findings reported in section 2 that SLI children's problems extend beyond the realm of morphology.

Although movement/checking provides a characterisation for the RDDR account, van der Lely assumes that the omission of this process is only a secondary deficit, which reflects a more complex aetiology. Van der Lely (1998) considers a number of possible explanations for SLI children's optional omission of the movement process. She argues

that a deficit in the economy principles, which constrain movement's application, may provide a basis for her characterisation. Accordingly, she suggests that a selective impairment of the Last Resort principle (Chomsky, 1993), which ensures that only appropriate movement operations take place, may account for SLI children's production.

Van der Lely argues that Last Resort can be seen as comprising two components. The first, which she calls 'Economy 1', is the aspect of Last Resort which ensures that movement only takes place in order to satisfy a checking relationship. The second, 'Economy 2', is the aspect which forces movement to take place in order to satisfy these checking relationships. Van der Lely notes that inappropriate movement is not a characteristic of SLI children's production and, accordingly, argues that Economy 1 must still be active in the SLI child's grammar. A deficit in Economy 2, however, which makes this movement obligatory, would be consistent with SLI children's production. Van der Lely argues that Economy 2 is absent from SLI children's underlying grammar and that, as a result, movement becomes a 'free choice' (optional).

Under van der Lely's account, the SLI child's grammar is less restrictive than the ND steady-state, allowing for a greater range of admissible constructions. In particular, van der Lely claims that the deficit allows for the optional production of either the base or the derived form of a linguistic expression, as well as difficulties with the comprehension and judgement of these forms.

The evidence to which van der Lely points in support of her wider characterisation, is convincing. In the next chapter, I will adopt this characterisation and further test its claims with respect to a relatively new domain, negation. In addition, I will evaluate some of the predictions which arise from van der Lely's account of this characterisation, relating to how the problematic elements of SLI children's language are affected.

Despite my support for van der Lely's characterisation of the disorder, I feel that her approach encounters some theoretical difficulties. These, while not insurmountable, are problematic and should be discussed.

First, Van der Lely argues that the deficit she proposes should predict the mirrored optionality in production and comprehension. However, given that she argues that movement is a free choice for the SLI child, the underived forms, which reflect the

absence of this movement, should always be a grammatical option for them. However, as Van der Lely and Ullman (1997) observed, this does not appear to be the case. They found that on grammaticality judgement tasks, which tested a range of problematic constructions, the SLI children not only accepted the ungrammatical forms but they mirrored their production by optionally rejecting them as well. Van der Lely (p.c.) has suggested that a possible explanation for this is that, when the derived form of a sentence is selected by the SLI child's grammar, this should be taken as a reflection of the normal constraints applying (Economy 2, in this case). As such, when this occurs in grammaticality judgement tasks, the base form of a derivation would be rejected as normal. I feel that this claim encounters difficulties, however. Given that it requires the optional application of the constraints encapsulated by Economy 2, it excludes the possibility that this constraint can be completely absent from the grammar and requires an unexplained underspecification of Economy 2. The strength of van der Lely's account lies in the fact that the deficit provides an explanation for the optionality of the SLI child's grammar, rather than being subject to it.

Another potential difficulty concerns van der Lely's suggestion that her deficit within Last Resort would make the movement operation optional for the SLI child. As the account stands, this cannot be the case. Given van der Lely's stipulation that Last Resort provides the motivation for movement, without such a motivating factor a Minimalist grammar would predict that movement would not take place at all. Chomsky, 1995 illustrates this point: "while merge is costless for principled reasons, movement is not: the operation takes place only when forced (Last Resort), and it is overt, violating procrastinate, only when that is required for convergence" (Chomsky, 1995; p. 235).

These factors suggest that Van der Lely's account is, at the very least, incomplete. They motivate the development of alternatives which might better account for her characterisation. This will be the focus of section 6, and in the subsequent chapter I will examine some evidence which further evaluates these possible alternatives.

2.3.2.2.2 The Impaired D-system account (Tsimpli and Stavrakaki, 1999)

Tsimpli and Stavrakaki (T&S) have subsequently developed a similarly wide characterisation of Greek speaking SLI children's language (cf. T&S, 1999). Their work

marks a sizeable advance in SLI research, applying rigorous criteria to non-English speaking SLI groups and, accordingly, providing a wealth of cross-linguistic comparable data. Their SLI group was established using the criteria outlined in van der Lely, 1996 as being consistent with the Grammatical-SLI subgroup. Based on their findings, they argued that the children's deficit could be associated with an impaired D-system, whereby the elements which fall into this category are not taken to be part of the SLI child's grammar. Such elements minimally include the definite article, object clitics and wh-phrases. T&S distinguish the D category in Greek from other elements which participate in the nominal system on the basis of the LF-interpretability of their features. They argue that the elements comprising the D category consist of the non-interpretable features of Case and object agreement (cf. T&S, 1999).

Following this line, Tsimpli (1999, 00) extends the analysis to the verbal agreement and tense marking domain. She notes that, in contrast to findings from English, these elements seem relatively unproblematic (with the exception of the 2nd person). Tsimpli formulates an account of this inconsistency based upon the phonological saliency of the tense distinction in Greek. She argues that this could be responsible for the relatively early and unproblematic emergence of these features in Greek, suggesting that phonological marking, in contrast to morphological marking, may provide a crucial cue to the child. She also links this to her findings from verbal agreement, arguing that mastery of the tense distinction will result in the development of agreement distinctions at the same time, since they are not morphologically distinguishable.

T&S link the problems experienced by SLI children to the omission of A and A-bar movement. This is based upon the absence of the uninterpretable features which underlie these processes. In a more recent work, Stavrakaki (2000) has followed Paradis and Gopnik, 1997, by proposing that the apparent appropriate use of the D category, which is optionally found, can be attributed to the application of explicitly learned strategies. Under this view, the child's ability to apply these strategies varies as a factor of the structure's complexity, which Stavrakaki defines on the basis of a series of parsing preferences. These variables, working in conjunction with other factors such as processing considerations, direct the child's performance.

T&S's characterisation of SLI is broadly similar to van der Lely's, sharing many of its important characteristics. However, their account of SLI children's deficit contrasts quite severely. They propose that the deficit relates to the complete absence of certain features and that the apparent optionality in their use can be attributed to the application of explicitly learned strategies.

As was discussed in relation to both Clahsen's and Gopnik's accounts, I have a number of reservations with respect to the proposal that SLI children's optional use of fully specified forms reflects the application of non-linguistic strategies. T&S's account overcomes some of these problems. Specifically, they allow for the apparent optional application of the strategies by appealing to parsing considerations. However, there is a range of evidence which suggests that SLI cannot relate to a complete absence of any single element or groups of elements. In the next section, I will examine certain generalisations about the disorder, focussing in section 2.4.3 on this specific claim.

2.4 Generalisations

In this section, I will argue that three fundamental generalisations underlie the characterisation of SLI. These generalisations will be crucial to our understanding of SLI's character and will inform both the discussion to follow and the development of a new account of the disorder. The three generalisations are listed below:

Generalisation 1: SLI children's deficit relates to both their productive and receptive abilities.

Generalisation 2: SLI children's errors are uni-directional in their nature.

Generalisation 3: The SLI child's language displays true optionality.

The first generalisation is relatively straight forward, a purely empirical issue. To some extent, it is a product of the specific sub-group which is our focus. I will not attempt to argue that all SLI children have a deficit in both the productive and receptive domains, as this is clearly not true. However, I will consider the theoretical implications for the sub-group of SLI children who do suffer difficulties in both these domains. Generalisation 2 is more difficult. It relates to the observation that the children's errors are primarily omissions of obligatory elements or processes, rather than commissions of

inappropriate forms. I will argue that this generalisation holds for the SLI child's grammar and then consider its implications. Finally, Generalisation 3 focuses upon the optionality of the SLI child's grammar. While no one denies that SLI children's production contains an additional optionality, this generalisation focuses upon the contentious issue of whether all of these options are representative of the grammar. I will argue that, for the main part, they are.

2.4.1 Generalisation 1

This generalisation differs from my other two. It specifically refers to an empirical question which has, to a large degree, already been answered. While many SLI children appear to only suffer difficulties in one domain, comprehension or production, an equally large number present with comparable deficits in both domains. With respect to the SLI subgroup which is my focus, Generalisation 1 appears to hold. As such, it should not require any further qualification. However, it would be useful to consider the implications of Generalisation 1 for explanations of the disorder and I do this briefly now.

Generalisation 1 relates specifically to the question of whether SLI reflects a purely linguistic deficit. Consider the model of the language faculty in figure 4 (adapted from Smith and Tsimpli, 1995):

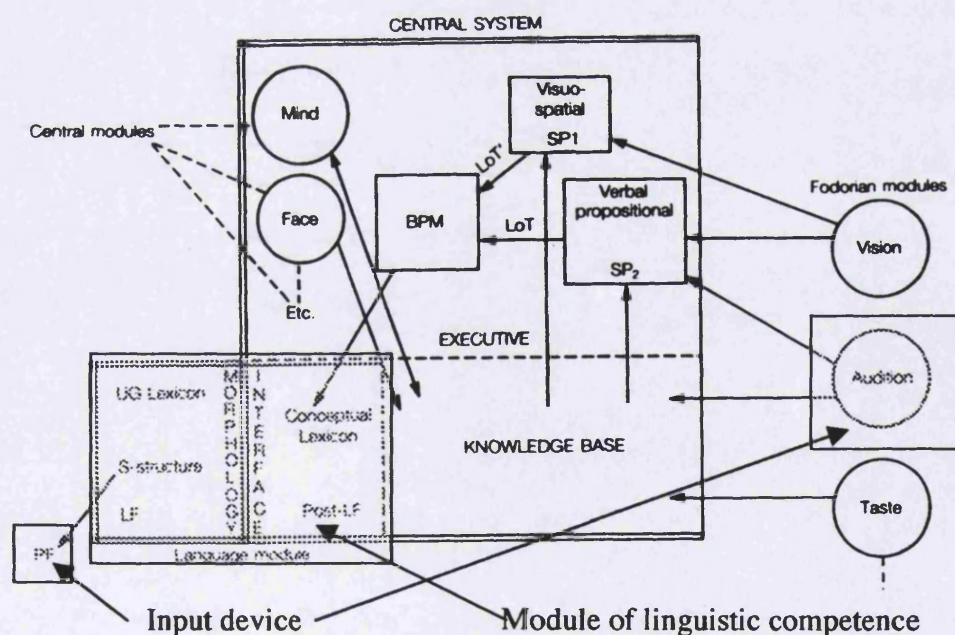


Figure 4 model of the language faculty.

Three components are of particular interest; the input device, the output device, and the module of linguistic competence. The module of linguistic competence could be thought of as our knowledge of the language, essentially the grammar. The input and output devices, then, are the components which allow us to access and use this linguistic competence. While this is a grossly simplistic view, it will serve to demonstrate a point.

If we were to find that Generalisation 1 was incorrect, it would be almost impossible to relate the child's deficit to their linguistic competence. The fact that one domain of the child's language is unaffected would suggest that the spared domain must have access to an unimpaired competence module. The alternative would, of course, be to suggest that the child's deficit relates the mechanisms which *interact* with the language module. This would seem plausible in these circumstances, if, for example, only the output mechanism is affected, we should expect that only the production arising from the linguistic module would be affected. This is the stance adopted by processing accounts of the disorder.

Alternatively, if Generalisation 1 holds, then the proposal of a deficit relating to the child's linguistic competence becomes a possibility. While the proposal that the non-linguistic accessing mechanisms may still be the locus of the child's deficit is not entirely ruled out, it becomes quite difficult to formulate a plausible explanation of the disorder, without proposing two separate deficits, one acting upon production and the other on comprehension.

Accordingly, the status of Generalisation 1 has profound consequences for anyone attempting to formulate an account of the disorder. On this basis, we can assess the plausibility that the children's deficit is located within this linguistic module. Given that Generalisation 1 seems to hold, this is a distinct possibility.

2.4.2 Generalisation 2

It is a widely reported finding from studies of SLI that the children's errors are primarily omissions of obligatory forms, while commissions are rare (cf. Leonard et al., 1992; Bishop, 1994; Rice et al., 1995). This, if true, has significant consequences for the underlying nature of SLI because it suggests that the elements or processes which are subject to the deficit are still constrained to some degree as they are in ND. As such, their

failure to appear in obligatory contexts cannot be a reflection of a total freedom in their application, with the implication for an explanatory account of the disorder being that the deficit should not relate to the principles which constrain the application of these processes or elements.

The suggestion that SLI children's errors are uni-directional is not uncontroversial, however. A number of studies cite data which appears to be at odds with the predictions of this generalisation. In particular, Myrna Gopnik and her colleagues have argued against this view (cf. Gopnik 1990a, 1990b; Gopnik & Crago, 1991). This stance was based upon the observation that their SLI children sometimes produced utterances of the form exemplified in 8;

8 You make one points (Gopnik, 1990b)

In 8 the child has clearly produced a commission error, inserting the plural -s morpheme inappropriately. In addition, Gopnik reports that this form of sentence was produced correctly in almost identical contexts at other times.

According to Gopnik, the SLI child does not grammatically distinguish the bare form (e.g. jump) from either the inflected past tense or plural form (e.g. jumped and jumps). As such, they are free to insert them in any context, irrespective of their perceived functional requirement. If production of the form exemplified in 8 is truly characteristic of SLI children's language then it would be impossible to maintain Generalisation 2. However, I argue that commission errors of this form are not characteristic of SLI. While Gopnik did not statistically analyse the productivity of the commissions, subsequent studies, while reporting commission errors, suggest that these were no more frequent in the speech of SLI children than they were for the MLU controls (cf. Leonard et al., 1992; Bishop, 1994; Rice et al., 1995). This finding is crucial because it suggests that these errors are not specific to the SLI child's grammar, but rather a more general developmental characteristic. Table 3 reports the findings from two studies which consider this factor:

	Leonard et al. (1992)		Rice et al. (1995)	
	SLI	MLU	SLI	MLU
Articles	<1	1		
Plural	2	2		
Third singular	8	8	0	0
Regular past	0	0	0	0
Copula <i>be</i>	4	5	7	9
Auxiliary <i>be</i>			4	5

Table 3. Percentages of inappropriate use of grammatical morphemes (adapted from Leonard, 1998)

These findings clearly suggest that morphological commission errors are not a characteristic of the SLI child's grammar. This is with the qualification that, although these errors do occur, it is to an extent that is comparable to the children's language matched controls.

Given these findings, it seems that Generalisation 2 holds at least for the domain of (English) inflectional morphology. However, SLI children's difficulties are not restricted to this domain, and for the generalisation to be meaningful it must be demonstrated that it holds for all the linguistic domains which are subject to the children's deficit. The generalisation requires further qualification in two other domains before it can be adopted.

The first of these relates to the domain of structural Case. In section 2.4 we discussed findings from this domain, reporting that significant difficulties were observed. SLI children appear to have particular difficulty assigning nominative Case to pronominals, with the accusative form often surfacing in the subject position. These findings are potentially problematic for Generalisation 2 because they clearly represent a commission error, an appropriate form has been substituted by an inappropriate form. Generalisation 2 would predict that where the SLI child's grammar is unable to access the correct form, the element would be omitted, rather than subject to substitution.

However, a possible explanation for this violation is that the SLI child is simply unable to omit the Case feature. Case, unlike verbal morphology, is intrinsic to its nominal category. As such, there would be no Caseless lexical entry available to the child's grammar. Omission of the nominal in its entirety would not presumably be an option, and therefore the child has to insert an inappropriate form. This seems a reasonable solution.

In addition, the distribution of the Case errors also appears to support this proposal. As was noted in section 2.2.4, the Case errors are restricted to subject nominals. Schutze & Wexler do not report problems with accusative Case assignment. Also, they observed that the substitute Case is always accusative, never genitive. These findings would be unexpected if we were to propose that the SLI children could freely overgenerate Case forms. As discussed, Schutze & Wexler take the distribution of these errors to indicate that there is a default Case strategy in action. This would also be unusual if the child could freely substitute Case; a default would be pointless. As such, it appears that, while Case production is an apparent exception to Generalisation 2, this exception is principled and predictable.

The second domain in which findings seem to run contrary to Generalisation 2 is wh-question formation. As was observed in section 2.2.3, SLI children regularly produce wh-questions containing an additional wh-element. Consider examples b and c in 9.

- 9 a. What did John hit?
 b. *What did John hit something?
 c. * What did John hit what?

This form of production clearly represents a commission error. Note, however, that it is not of the same form observed for Case assignment. This type of error is not a substitution error, the inappropriate item is additional to the normally subcategorised arguments of the verb.

As with the Case errors, I feel that this form of production is not necessarily problematic for Generalisation 2. Again, there are characteristics of the distribution of these errors which suggest that they are not simply the reflection of blind over-generation. For example, studies rarely report wh-questions without a sentence initial wh-element, even when this is grammatical. In addition, there is little evidence from other domains that the theta criterion is ever violated by the SLI child, although it is here.

A number of researchers have proposed that these apparent commissions are the result of an explicitly learned strategy, which specifies that a wh-question must have a sentence initial wh-element (cf. van der Lely, 1998). These findings support this view. The strict pattern observed in the distribution of the errors is consistent with a rote

learning strategy. In addition, this explains the apparent violation of the theta criterion. If the child is strategically inserting the *wh*-element in the sentence initial position, then this leaves the VP internal argument position vacant. As such, the SLI child is free to fill this position with another argument, producing the apparent commission errors observed.

Again, considering the restrictions which appear to hold in other domains, this proposal seems plausible. Standard therapy would promote this type of strategy and the saliency of the objects involved would make them easily formable. I therefore conclude that these commission errors are not characteristic of the SLI child's grammar.

2.4.3 Generalisation 3.

An optionality is reported in SLI children's language. They are observed to produce and accept both grammatical ND forms and ungrammatical omission forms in identical contexts at different times (cf. van der Lely, 1998). It is clearly true that SLI children's language contains an additional range of options which are not available to the ND grammar. However, what is less obvious is whether or not all of these options are representative of the SLI child's grammar, or whether some are the product of non-linguistic processes. The question I hope to address in this sub-section is whether both the fully specified form and the omission form of an utterance are products of the SLI child's grammar, or whether one of them might result from an explicitly learned cognitive strategy.

To consider the latter option first, there are two logical possibilities; either the fully specified (ND) form is representative of the child's grammar, with the omission form being the product of some other deficit, or, alternatively, it is the omission form which reflects the SLI child's grammar, while the specified form surfaces as the result of a non-linguistic strategy. The first of these two possibilities, which suggests that the SLI child's grammar is, in effect, normal, equates to the position held by the processing accounts of SLI. I will not discuss this position here as I have examined it earlier in section 3.1 and suggested that it is untenable. Instead, I will focus upon the second possibility, that only the omission form reflects the SLI child's grammar. This view is advocated by a number of accounts of the disorder. Most notably, these include Clahsen's

Agreement Deficit account, Tsimpli and Stavrakaki's Impaired D-system proposal, and later versions of Gopnik's Implicit Rule Formation Deficit account.

Although the exact nature of these accounts differ, with each relating the children's deficit to different elements or domains, they share a key characteristic, each suggesting that the elements or processes which are problematic for SLI children are absent from (or persistently unavailable to) their grammar. The implication of this is that the grammatical (ND) form should not surface as a product of the SLI child's grammar, but rather its occurrence should be interpreted as being a reflection of the child's application of explicitly learned strategies which compensate for the inappropriate instructions of their grammar. These accounts assume that only a subset of the SLI child's production reflects their underlying grammatical structure.

An alternative proposal, which I will advocate here, is that both the grammatical and ungrammatical (omission) forms are products of the SLI child's grammar. This position is advocated in accounts like Rice et al's Extended Optional Infinitive and van der Lely's Representational Deficit for Dependant Relations. They suggest that the SLI child possesses a wider range of grammatical options and that, in effect, the grammar is more inclusive, differing fundamentally from ND.

In the remainder of this sub-section, I will examine some of the evidence for and against these two positions. I will argue that various findings from SLI research suggest the grammatical forms produced by SLI children are indeed representative of their grammar.

From the discussion in section 3, it was apparent that the distribution of SLI children's errors was not consistent with either Clahsen or Gopnik's proposal. It was noted that the optionality in the children's grammar related to single elements, rather than to whole domains. In other words, the children could specify or omit the same element optionally. Given Clahsen and Gopnik's formulation of the proposal, the specification or omission of a single element should remain constant. It does not, and as such, the proposals were rejected.

However, Stavrakaki (2000) formulates an accommodation for this data. She proposes that the SLI child's ability to apply the compensatory strategies which result in the specified form is mediated by a range of parsing requirements. When these


requirements are not met, the child cannot apply the strategy which allows them to correctly specify the components of an utterance. This is a relatively neat solution, making use of the mechanisms from a number of proposals, however, I feel that certain data suggest that it is incorrect.

The data which bear upon this issue relate to the formation of *wh*-questions containing embedded clauses. Consider the example in 10.

10 What did you think John ate?

The derivation of the sentence in 10 involves the *wh*-element *what* raising twice; first from the base position, internal to the VP, to the embedded C and then again to the matrix C position. This is represented in 11 below. Why not use the same sentence?

11 [What_i does [Dorothy think [_{CP} t_i that [_{IP} Jane will sell t_i]]]]



The diagram consists of two horizontal lines. The top line represents the matrix clause, with 'What_i' at the beginning and 'does' at the end. The bottom line represents the embedded clause, with 'Dorothy think' at the beginning and 'that' at the end. A vertical line connects 'What_i' to the embedded clause, and another vertical line connects 'does' to the embedded clause. A horizontal line connects the two vertical lines, representing the movement of the *wh*-element from the base position to the embedded C position and then to the matrix C position.

The SLI child's performance on this type of construction is significant because it involves a movement process to a non-surface position. If we assume that the ND form only results as the product of a non-linguistic strategy, then the surface position of the *wh*-element would not be derived. As a result, this position should never be filled in the process of a derivation.

However, evidence from studies which have examined this construction observe that the *wh*-element sometimes surfaces in this medial position (Smith, 1992). Consider the example in 12.

12 What do you think what Evelyn broke? (data reported in Leonard, 1998)

This finding is extremely significant because it clearly points to the conclusion that the surface position of the *wh*-element is derived. The *wh*-element in 12 appears to have successfully undergone its first movement operation, but has failed to undergo the necessary second operation to derive the matrix C position. As the embedded C is not a legitimate surface position, it would be implausible to suggest that the position of *what* in 12 reflects a compensatory strategy, as this strategy would be useless and, quite likely, impossible to formulate. If the processes which affect the derivation of the *wh*-element in 12 were not present at some point then we would be unable to explain this form of data.

Given this evidence, I reject the hypothesis that any single linguistic element or process is entirely unavailable to the SLI child's grammar. I therefore adopt Generalisation 3.

2.5 Evidence from cross-linguistic research

SLI has been studied in a number of languages other than English. In this section I will briefly look at some of the most interesting findings that have emerged from these investigations. Although this is an extremely important area of SLI research, my discussion will be limited somewhat. I'll look at some findings from just four languages; German, Italian, Hebrew and Inuktitut.

2.5.1 German.

First, let's consider some of the significant characteristics of German phrase structure. In declarative main clauses, the finite form of the verb always surfaces in second position. Accordingly, when the sentence begins with an adverbial such as '*yesterday*', or the direct object through topicalisation, the subject will surface after the finite verb, as exemplified in 13;

13

- a. Die Frau fand die Kinder
the woman found the children.
"The woman found the children"
- b. Gestern fand die Frau die Kinder
yesterday found the woman the children
"yesterday the woman found the children"
- c. Die Kinder fand die Frau
the children found the woman
"the woman found the children"

When auxiliaries are used, these appear in second position and the infinitive or past participle form of the verb surfaces in final position. This is exemplified in 14;

14

- a. Ich will das kochen
I will that cook
“I want to cook that”
- b. Ich habe das gekocht
I have that cooked
“I have cooked that”

In subordinate clauses, the finite form of the verb surfaces in clause-final position, as exemplified in 15;

- 15 Peter sagt, daß die Frau die Kinder fand
Peter says that the woman the children found
“Peter says that the woman found the children”

Evidence from studies of German speaking SLI children suggest that word order errors abound. While it was found that in most cases where a finite form was used its positioning was appropriate, surfacing in the second position, there are many cases where an inappropriate form of the verb is used. Harald Clahsen’s research in this area has been extensive. He argues that, for some reason, the finite form of the verb is not always available to the SLI child when required. As a result, the non finite form is used and this surfaces in clause-final position. Clahsen points out that, while this position is inappropriate for the context, it is the correct position for the verb form that was used. Clahsen argued that these problems could be linked to a more fundamental problem in establishing agreement relations.

While this explanation was broadly consistent with the findings from most of his SLI group, one child’s production did not adhere to this pattern. This child produced many finite verb forms but they surfaced incorrectly in the final position. This pattern was also observed in an earlier study conducted by Grimm (1983). Clahsen noted that, while the positioning of finite verb forms was often inappropriate, modal verbs were consistently positioned correctly. This prompted him to suggest that, for this child, only

modal verbs possessed the requisite properties for movement to the second position. Though the other verb forms were correctly inflected, Clahsen argued that this was the reflection of word formation rules.

2.5.2 Italian.

Italian is a language which is an obvious choice for cross-linguistic comparison studies. It has an extremely rich morphological structure, all nouns, verbs and adjectives are inflected (with the possible exception of some loan words). Nouns are inflected for number (singular, plural) and gender (masculine, feminine), with adjectives similarly inflected in agreement with the nouns they modify. Verbs are always inflected for tense, person and number with the bare form of the verb never surfacing and, as such, not assumed to be a legitimate lexical entry.

Italian has a canonical word order of subject-verb-object. This is subject to variation, however. The subject is often omitted from utterances where the referent can be fixed from the physical or conversational context and the verbal morphology also permits variations.

There has been a relatively large amount of SLI research on Italian. However, morphological comparisons are often difficult to draw, since directly corresponding forms are rarely available. Studies from Italian SLI children suggest that they have particular difficulty with the use of function words such as articles and clitics (cf. Sabbadini et al 1987). Researchers have observed that Italian-speaking SLI children suffer far fewer difficulties with grammatical inflections than do their English counterparts. However, when these errors are observed, they pattern differently. Commission errors are far more prevalent. This finding can presumably be explained because nouns, verbs and adjectives *must* be inflected, leaving no bare alternative (cf. Tsimpli, 1992, 96). The standard analysis is similar to the one proposed for the commission errors produced for Case marking.

Error analysis focusing upon the function word deficit reveals that these are mainly errors of omission rather than commission and that, when errors of commission

are observed, this resembles the level of production in the normally developing controls (Leonard 1998).

2.5.3 Hebrew

Hebrew verbs and many of its nouns and adjectives can be said to consist of two separate components; a root and a pattern. The root conveys the core meaning of the word and the pattern modulates this core by conveying notions such as reciprocity and causality. Within each pattern (or *binyan*) verbs are inflected for tense, number, gender and (in past and future tense) person. These inflections take the form of syllabic suffixes and vocalic infixes which appear between the consonants of the root. Nouns are marked for number and gender in the form of plural suffixes, and adjectives follow the nouns they modify agreeing in number and gender.

Hebrew's canonical word order is SVO. However, as in Italian, this can be variable, at least in the spoken form. In addition, subjects can be omitted in past tense and in first and second position.

Dromi et al. (1993) studied Hebrew speaking SLI children's use of inflections which corresponded to the most commonly-studied features, such as number, gender, person, and tense. Their findings indicated that these forms did not appear to be particularly problematic. However, this was not the complete picture. Leonard notes that, when the overall accuracy of the verb form was examined, significant differences between the test groups did emerge. Many of the differences related to the weak initial and medial syllables of the verb, which constitute an important locus for verb pattern distinctions. Dromi et al. (1993) report that SLI children are significantly more likely than MLU controls to omit sounds or syllables that result in pattern errors. They also report difficulty on tests assessing the use of the phonotactic rules which permit verb formation.

2.5.4 Inuktitut

Inuktitut is an Inuit language of northern Canada, part of the Eskimo-Aleut family. It exhibits a high degree of polysynthesis, with a prolific verbal and nominal inflection system. Verbal inflections agree with both the subject and object and distinctions are made for four persons, three numbers and ten verbal modalities. Nouns can have eight

cases and three numbers and the possessive paradigm encompasses the four persons and three numbers. Examples from Crago and Allen (1996) are given in 16 and 17 below:

- 16 Quttukallakutaatsiaraapimmut
 qut-juq-kallaq-kutaaq-tsiaq-apik-mut
 be.funny-NOM-DIM-tall-nice-handsome-ALL.SG
 ‘To a nice tall handsome cute funny person’
- 17 Annuraarsimalukatsitipaujaalumijug
 annuraaq-sima-lukat-siti-paujaaluk-u-mi-juq
 clothe-PERF-unusually-well-very-be-also-PAR.3sS
 ‘She also often dresses up very unusually’

Inuktitut is an ergative language with SOXV word order and ellipsis of both subject and object. In addition, there is no uninflected infinitival form.

Findings from the Inuktitut sample concur with English studies in that the SLI child is far more likely to omit obligatory verb inflections, produce bare stem locatives and use pronoun forms where the reference is ordinarily made by means of an inflectional element *-mi*. This form is most frequently used on nouns as the singular locative ending (in), the singular modal Case ending, and occasionally on verbs as an internal morpheme with the meaning *also* (Crago and Allen 1996). However, the Inuit in C&A’s study used *-mi* in a highly irregular way as a filler, placing it in inappropriate positions in a sentence, on the ends of verbs or locatives. C&A 1996 note that neither the MLU nor age-matched children had this type of error and suggest that it is highly irregular for ND Inuktitut speakers of any age.

2.6 A new account: The Principle Conflict Account (PCA)

In this section I will formulate a new account of SLI children’s deficit. For any account of the disorder to be meaningful, it must make testable predictions. These predictions take two forms; predictions about which aspects of the children’s language are affected, and predictions about the nature of this deficit. The first type of predictions relate to, and are a consequence of the characterisation of the disorder. For a characterisation to make such

predictions, the elements taken to be problematic must form a coherent group, whose membership is predictable in a principled way. For example, it would not be sufficient to suggest that a range of elements are subject to SLI children's deficit without providing some common criteria through which their grouping may be independently predicted.

As I have suggested in previous sections, I assume a characterisation of SLI similar to the one developed by Heather van der Lely in her RDDR research program. This characterisation assumes that the syntactic operation of movement, as it is outlined in Chomsky's 1995 framework, marks the area of difficulty for SLI children. This characterisation makes a range of predictions which are open to empirical testing. Not only are the transformations themselves predicted to be problematic but, as a result, the elements whose interpretation is dependent on them are also.

The second type of predictions which my account provides, relating to the nature of the deficit, reflects the underlying explanation of the disorder, its aetiology, providing the basis of a characterisation. In section 2.4 I proposed three generalisations of SLI children's language. Generalisation 1 related directly to the characterisation of the disorder, specifying that SLI children's deficit should be taken to hold for both their productive and receptive language, while Generalisations 2 and 3 related mainly to the explanation of the deficit.

If we relate Generalisation 3 to the characterisation of the disorder it is clear that the movement operation itself cannot be absent from the SLI child's grammar. If this were the case then the appropriate ND form could never be a reflection of the child's grammar. As discussed in section 2.4.3, this proposal seems to be untenable. Rather, it seems that in some cases movement occurs as normal while at other times it is omitted. This fact must be reflected in the explanation of the disorder.

Generalisation 2 also has important implications for the development of an explanation of SLI. Although the obligatoriness of movement processes does not appear to be consistent in SLI children's language, as noted in section 2.4.2, this unreliability does not extend to movement being forced in inappropriate situations. As such, the deficit which provides the basis for SLI must reflect the preservation of these constraints on movement's application.

In the remainder of this section, I will briefly examine the implications of proposing movement as a characterisation of SLI children's linguistic deficit. This discussion will act as a basis for the experimental data to be presented in the next chapter, which tests some of these predictions with respect to negation and neg movement. I will also develop an explanatory account of this characterisation, which will be based upon the generalisations already discussed.

2.6.1 Movement as a characterisation of SLI

Movement is the transformational component of the Principles and Parameters framework. Without engaging in too many technicalities (for more details see Chapter 1), it is the process by which a syntactic object is formed through the concatenation of two syntactic objects which are members of a single phrase marker (this process is described as 'internal merge' in the most recent formulations of the account, Chomsky 2001).

The most obvious outcome of a movement deficit is word order problems. In English some of the clearest examples in which word order changes are effected by movement are in the formation of interrogatives. Consider the examples in 18.

- 18 a. Is_i she t_i happy?
 b. Why_j is_i she t_i happy t_j?

Example 18a illustrates the formation of a closed interrogative. This involves the application of a single movement process by which the auxiliary verb *is* moves to the C position. Example 18b illustrates the formation of an open *wh*-interrogative. Here, in addition to the A-movement of the auxiliary, the object *wh*-element raises to the Spec C position. According to the characterisation which I am assuming, both of these movement processes should be subject to omission in SLI children's language. If we refer back to section 2.2.3, in which SLI children's abilities in this domain were examined, this prediction appears to hold, with examples such as **Why she is happy why?* regularly observed.

In addition to these problems with word order, the processes which are dependent upon structural relationships, such as thematic role and reference assignment are also predicted to be problematic. As discussed in section 2.2.2 this prediction also appears to

be borne out when the children's performance cannot be guided by non- linguistic information. My interpretation of this is that, when children misinterpret these structural relationships, they are unable to reconstruct the movement processes which took place in the derivation of the utterance.

Of course, word order and structural relationships are not the only domains which are subject to SLI children's deficit. Can a deficit relating to movement account for the children's morphological deficit? This is a point upon which the movement characterisation encounters some difficulty. If I adopt a purely Chomskian approach, then this entails a strictly lexicalist view of the grammar under which a lexical item is taken from the lexicon already fully inflected. While Chomsky (1993, 95) holds that lexical items must still associate syntactically with the appropriate functional heads, this is only in order for their inflectional properties to be checked against the abstract features of these functional heads. It is not clear that their emergence is in any way dependant upon this process.

Given this view, the omission of a movement process should never result in the omission of an inflectional affix, its specification not being dependant on the movement process taking place. Rather, we would expect that the optional omission of movement would result in inappropriate forms surfacing, since they are not subject to checking.³ This is clearly not consistent with the data reported in section 2.2 or indeed with Generalisation 2. As such, I will reject Chomsky's strict lexicalist approach⁴ and adopt an analysis in which affixation, or at least its interpretation, is seen as a post-lexical process. As a working hypothesis I will assume only a minimal departure from Chomsky's approach: that while a lexical item enters the syntax with its full complement of formal features, these are not realised in the sense of interpretability unless the checking process takes place. The departure advocated here is not strictly at odds with the 1995 view of the Minimalist Program. Chomsky (1995) is to some extent vague on the subject of checking's motivation, beyond specifying that it relates to the necessary elimination of uninterpretable features. In addition, the most recent versions of the Minimalist framework (Chomsky 1999, 01) adopt a similar view in which uninterpretable features

³Here I put aside the issue of the unchecked features of functional heads, given that we are dealing with performance data

receive their value through the process *agree*. For a discussion of these developments and their implications, see Chapter 4. With this assumption, the movement characterisation can capture SLI children's morphological deficit. In addition, it is able to provide the basis for the inclusion of a wider range of difficulties relating to syntactic structure and syntactic relations.

I will now proceed to sketch an explanatory account to underlie the movement characterisation I advocate. The generalisations discussed in section 4 will provide a basis for my proposal. Firstly, I propose that SLI children's deficit relates to their grammar, rather than to the processes which access this grammar. As discussed in section 4.1, Generalisation 1 is crucial to this assumption. The grammar itself cannot be deficient if the productive and receptive components are not both subject to the children's deficit. Secondly, I relate the deficit to the processes underlying movement. As discussed with relation to Generalisation 3, the movement process itself cannot be entirely inaccessible, since it is optionally available to the child in a way that is representative of their grammar. The explanatory account must find a way of making the movement operation only optionally available to the SLI child in circumstances where it is obligatory in ND. In addition, as Generalisation 2 suggests, the movement process should only be an option in those circumstances where it is appropriate in ND. It would not be sufficient to say that the child freely applies these forms irrespective of their morphological specification.

I propose that SLI children's deficit relates to the economy principle, 'Procrastinate', which Chomsky defines as in 19;

19 "Movement must be done after spell-out whenever it is possible to converge by doing so" (Chomsky 1995: 198).

Procrastinate marks the cost distinction between overt (prior to spell-out) and covert (post spell-out) movement. It achieves this by specifying that movement, which is taken to be a costly process, should be delayed as long as is possible without causing the derivation to crash. This has the effect of creating two movement processes: movement before spell-out, which is forced by strong features, and movement after spell-out, which is forced by the requirements of Full Interpretation. In SLI, however, I suggest that

⁴A step which is made implicitly in many of the accounts discussed (cf. Rice et al and Van der Lely)

Procrastinate is strengthened so that it carries the instruction that movement should not take place at all.

Given this proposal, procrastinate would prohibit all movement processes from taking place. However, as we have observed, this would not be consistent with the data. SLI children do produce the correct derived forms. If we were to suggest that these forms did not reflect the child's grammar then we would be in conflict with Generalisation 3.

To explain the coexistence of these two forms, we require an interaction between the now strengthened principle of Procrastinate and the principle of Full Interpretation (FI). FI forces a range of movement processes to take place, in order to eliminate all uninterpretable features from a derivation. By FI, a derivation which does not contain sufficient movement to eliminate all uninterpretable features will fail to converge at LF and crash. The 'must move' role of FI overrides Procrastinate's delay function in the ND grammar to ensure convergence. However, in the SLI child's grammar, FI and Procrastinate conflict, one forcing movement and the other prohibiting it. As such, they cannot both be maintained and the SLI child is therefore forced to reject one of the principles in favour of the other. I take this choice to be completely optional, and made each time the two principles conflict. The result of this choice is that, for the SLI child, there are in effect two different grammars, each acting contrapuntally, selecting different optimal derivations from a single numeration.

The choice is made intra-sententially. That is, I assume that the principles may potentially conflict more than once in the course of a single derivation. This is based upon the observation that, at times, only a subset of the possible movement processes appears to take place. Consider the example discussed in section 2.4.3, repeated here as example 20:

20 What do you think what Evelyn broke?

In this example, the *wh*-element has undergone one movement process to the embedded C position, but has failed to subsequently raise to the matrix C position. In this case, I would assume that the application of the first movement process reflects FI taking effect. However, when the second movement process is required, FI has been rejected in favour of Procrastinate, which prohibits movement's application. If we assumed that the

choice between the two grammars was made only once per derivation, this data would not be predicted. Rather, we would expect that a single derivation would always either match ND or contain no evidence of movement.

Now let's examine some of the predictions of such an account. First, with respect to Generalisation 1, relating the deficit to the child's grammar necessarily predicts problems with both productive and receptive language for reasons discussed. Second, the account predicts that, for the SLI child, all forms observed in their production should be fully representative of their grammar(s), one optionally supplanting the other as optimal on the basis of Principle Conflict. The account is therefore consistent with generalisation 3. Third, we would not expect the inappropriate over-generation of these forms, since the constraints on movement's application, in particular the Last Resort principle, are still in place. The account is therefore also consistent with Generalisation 2.

At this point I'll conclude my discussion of the PCA, returning to it again in Chapter 4. In the next Chapter I'll turn to my empirical analysis, presenting a range of experimental studies which have been designed to evaluate some of the proposals discussed here.

SLI children's ability to utilise syntactic negation will be the focus of the experiments in Chapter 3. This domain provides a novel area of research and a valuable insight into many of the issues relevant to the present discussion.

Chapter 3

3.1 Experiment 1: The Production of Negative Sentences

3.1.1 the derivation of negative sentences

In this experiment, I will investigate the SLI children's ability to produce negative sentences. As a basis to the discussion I will briefly consider the derivation of these sentences in the adult grammar.

As an example, consider the simple negative in 1:

- 1 Dorothy did not see Betty

Sentence 1 illustrates a number of the main features of negative sentences. Most obviously, it contains the negative particle *not* which occupies the head position of the Negative projection NegP. In addition, it includes an auxiliary verb form *did* which, in negative sentences, is an obligatory feature. To illustrate, consider the contrast in 2a and b:

- 2 a Betty did not punch Dorothy
 b *Betty not punched Dorothy

Standardly, it is assumed that the auxiliary is required in a negative sentence because the NegP acts as a barrier to movement, preventing the normal process of LF verb raising. As such, the auxiliary verb raises in the overt syntax and carries out the checking which is normally facilitated by this process.

I will assume that sentence 1 has a base structure similar to that represented in 3⁵

- 3 [_{AgrsP} Dorothy Agr_s [_{TP} did_i T [_{NegP} Neg [_{AgrOP} Agr_o [_{VP} t_i [_{VP} punch Betty]

The structural representation in 3 demonstrates the overt movement of the auxiliary verb from its base position internal to the VP to the spec of TP.

Two issues arise from this analysis. The first is how the auxiliary verb can raise across the NegP, without violating the Head Movement Constraint (HMC), and the second is why the matrix verb is not able to do the same.

⁵For the moment I consider only the aspects of the sentence's derivation which arise from its negative property

A number of analyses have been proposed to address these issues with varying degrees of success. For my present purposes, I'll adopt one of these analyses which was formulated by Samuel Epstein (Epstein 1998).

The basis for Epstein's analysis lies in the principle of 'LF movement visibility', which was proposed by Chomsky (1993). This principle can be formulated as in 4:

- 4 *LF movement visibility*: In the LF component, semantically deficient (underspecified) categories are not visible to Move α .

LF movement visibility states that, if a category is semantically deficient, it is invisible to the operations of the covert LF syntax. Because categories such as auxiliaries and copulas are assumed to form part of this group, it follows that only movement in the overt portion of the syntax can satisfy the checking requirements of these lexical categories.

However, this only serves to explain why the auxiliary in 3 raises overtly, not how this is possible. To answer this question, Epstein makes the following proposal.

First, we suppose that the auxiliary *did* raises and adjoins to Agr_o, creating the new object [Agr_o[_vdid]+Agr_o]. At this point the agreement features of the verb are checked against the matching features of Agr_o, however, neither category deletes, as each contains uninterpretable features which still require checking.

Next, in order to check the tense feature on *did*, the category [Agr_oV+Agr_o] must raise to adjoin to T. As noted, this violates HMC because the head of the NegP intervenes between the extraction site and the target. However, Epstein argues that this transformation represents the movement of Agr_o, not V and as such would leave an Agr_o trace at the point of extraction (the head position of Agr_oP). While this trace still appears to cause an Empty Category Principle (ECP) violation, Epstein argues that this should not be problematic. Once the object (*Betty*) shifts to Spec Agr_o in the LF syntax, Agr_o (or more precisely its trace) will check against the Case feature of the object. Epstein argues that once the functional category completes its checking, it will automatically delete, removing the offending trace from the LF representation and satisfying the ECP which he suggests should apply only to the LF syntax (see Epstein 1987, 91).

In effect then, Epstein proposes that the functional category acts as a vessel to allow movement of the verb over the intervening negative head. Once Agr_o satisfies its checking requirements, it and its trace should delete, leaving the verb in the derived position without violating the ECP.

This seems to be a relatively neat analysis. However, the second issue still remains; why isn't the same ECP-satisfying movement allowed for LF raising of the matrix verb? Put simply, Epstein's response, once again, relates to LF movement visibility. Because the matrix verb is not semantically deficient, it cannot raise to SpecAgr_o until we reach the LF component of the syntax. Agr_o, however, *is* semantically deficient and, as such, the category [_{Agr_o} [_v see+s] Agr_o] formed by the object shift cannot raise to T because it would be invisible to LF operations. As such, the tense features of T and the verb would be able to check and the derivation would crash by FI.

Clearly, there are a number of issues still to be addressed here. However, for these purposes, this analysis will suffice.

There is one further aspect of negative sentences that we should consider before we move on to the discussion of Experiment 1. That is the process of negative contraction or reduction.

The process by which the negative particle *not* is reduced to *n't* and attached to the verb is somewhat contentious. While it has been suggested that the process is akin to the contraction of auxiliaries and copulas to subject nominals (i.e. *they are* > *they're*), a number of researchers have argued that this position needs to be reanalysed. Williams, 1995, for example, argues that the reduced negative form does not reflect a process of post-lexical contraction at all. Rather, he assumes that the 'negative auxiliary' forms a single lexically specified word that enters the syntax already formed.

There are a number of empirical reasons to adopt this analysis. For example, there are cases of negative contraction where the actual form of the lexical root is altered. Consider the contrast *will not* > *won't*: in this case, the phonological form of *will* is altered by the proposed process of contraction. Because this change alters the phonological nature of the word, it would be difficult to explain how this could take place post-lexically.

Another example is apparent when we compare the two contraction processes. The contraction of the negative particle does not seem to be constrained in the same way as verbal contraction. It is widely noted that verbal contraction cannot take place if it is adjacent to an extraction site. Consider the examples in 5:

- 5 a. Dorothy's on the bus and Betty is also
 b. *Dorothy's on the bus and Betty's also

However, this constraint does not seem to hold for negative contraction. Consider the examples in 6:

- 6 a. Dorothy's not on the bus and Betty's not either
 b. Dorothy isn't on the bus and Betty isn't either

If we assume that verbal and negative contraction are essentially reflections of the same process it would be difficult to explain the difference between the examples in 5 and 6. For the purposes of the present discussion, I will assume that the reduced form of the negative particle forms a single lexical word with its host verb and, as such, is not the reflection of a syntactic process. Now I will move on to describe Experiment 1.

3.1.2 Method

3.1.2.1 Subjects

Four subject groups participated in the experiment: a group of SLI subjects and three control groups of younger children matched for a range of different language abilities.

3.1.2.1.1 Specifically language impaired subjects

Fourteen subjects aged between 12:11 and 19:3 (mean 15:6) participated in this experiment. All the subjects had been classified as "Grammatical SLI", as detailed in van der Lely, 1996 and van der Lely and Stollwerck, 1996, using standardised and non-standardised procedures designed to assess the group's grammatical abilities (e.g. tense and agreement marking, thematic role and reference assignment). In table 1, I provide a summary of the subjects' scores from the standardised tests. The SLI children had a mean

equivalent age of 7:3 (11.9 SD) on the Grammatical Closure sub-test from the Illinois Test of Psycholinguistic Abilities (GC-ITPA) (Kirk, McCarthy & Kirk, 1968), which is a measure of expressive morphology. On the Test of Reception Of Grammar (TROG) (Bishop, 1983), a measure of sentence comprehension, their mean equivalent age was 7:6 (16.7 SD), and on the British Picture Vocabulary Scale (BPVS) (Dunn, Dunn, Whetton & Pintilie, 1982), a test of single word comprehension, they performed at a mean equivalent age of 8:6 (23.6 SD). These tests were used to match the SLI group with a number of Language Ability control groups.

Measure	SLI (N=14)	LA1 (N=12)	LA2 (N=12)	LA3 (N=12)
AGE				
Mean (SD)	15:6 (2.4)	6:0 (0:4)	7:0 (0:4)	8:1 (0:4)
Range		5:7-6:5	6:6-7:6	7:7-8:6
GC-ITPA				
Mean (SD)	21.86 (3.74)	22.58 (4.50)	27.0 (2.61)	28.08 (2.84)
AE	7:3 (1:0)	7:7 (1:4)	9:0 (1:0)	9:3 (0:11)
z-score	n/a	1.58 (1.16)	1.76 (0.56)	0.94 (0.83)
TROG				
Mean (SD)	14.36 (1.54)	14.67 (2.17)	15.83 (1.82)	17.50 (1.98)
AE	7:6 (4:5)	7:9 (1:9)	8:10 (1:7)	10:0 (1:6)
z-score	-1.80 (0.67)	0.64 (0.92)	0.54 (0.75)	0.98 (1:20)
BPVS				
Mean (SD)	78.21 (16.20)	61.08 (6.08)	76.33 (14.53)	84.67 (13.72)
Standard score	69.93 (8.33)	106.42 (6.6)	113.17 (14.24)	111.08 (14.65)
AE	8:7 (1:5)	6:7 (0:8)	8:4 (1:9)	9:2 (1:7)
z-score	-2.00 (0.56)	0.43 (0.44)	0.88 (0.95)	0.74 (0.98)

Table 1: Standardised scores for the test groups. AE = age equivalent; Standard deviations (SD) in brackets

3.1.2.1.2 Language ability control groups

Three groups of 12 normally developing children provided language ability (LA) control groups. A range of children were selected from a British state school. Children who fell within the normal range of abilities, as assessed by three standardised language tests,

were included in the study. The LA control groups' raw scores from the standardised language tests are provided in table 1.

The youngest (LA1) control group (mean age 6:0, range 5:7 – 6:5) did not differ from the SLI children on the two tests of morpho-grammatical abilities (GC-ITPA, TROG). However, the LA1 controls scored significantly lower than the SLI children on the test of vocabulary development, BPVS $t(11.52) = 3.03$, $p < .05$.

The LA2 control group (mean age 7:0, range 6:6 – 7:6) did not differ from the SLI children on TROG and the BPVS. However, the LA2 controls scored significantly higher than the SLI children on the test of morphology, GC-ITPA $t(20) = 3.51$, $p < .005$.

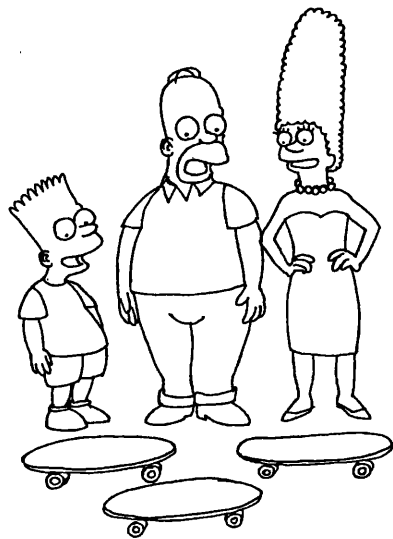
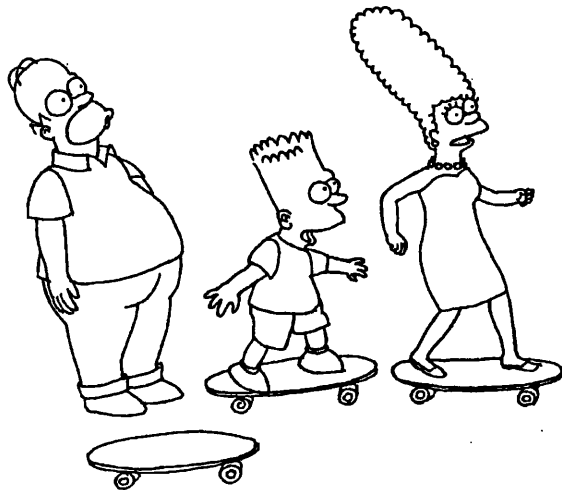
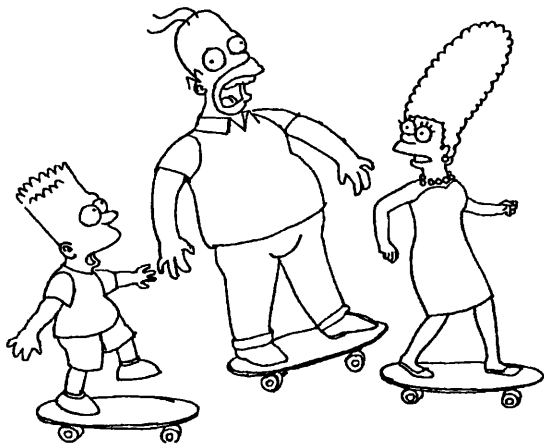
The older LA3 control group (mean age 8:1, range 7:7 – 8:6) did not differ from the SLI children on the test of vocabulary development (BPVS). However, the LA3 controls scored significantly higher than the SLI children on the two tests of morpho-grammatical abilities; the GC-ITPA $t(20) = 4.16$, $p < .0001$ and the TROG $t(20) = 3.56$, $p < .005$. Table 1 provides a summary of the LA control subject details.

3.1.2.2 Design

The aim of this experiment was to assess SLI children's ability to produce negative sentences. In order to elicit a sufficient number of negative constructions, a picture description task was used. The children were presented with a picture and then asked to listen to a sentence that described this picture. They were asked to judge whether the description was accurate and then to provide an explanation of their judgement. The explanation was invariably made with reference to the picture and took a descriptive form.

In spontaneous speech it is often difficult to determine precisely what the subject intends to say; in particular, it was relevant to know whether the subject intended to produce a negative form to determine whether the particle had been omitted. This design permitted a range of cross-referencing, that aided an accurate evaluation of the speaker intentions.

The pictures took three forms, exemplified in figure 1.



The pictures depicted three individuals from the Simpsons cartoon strip (Bart, Homer and Marge). All of the subjects indicated that they were familiar with the Simpsons cartoon and these characters. In picture type 1, all three individuals are depicted holding a specific property (in this case, on skateboards). In picture type 2, only a sub-set of them hold this property. In picture type 3, none of them hold this property. In all cases the only variant property in the pictures was the test condition.

The test sentences, which were provided as descriptions of the pictures, also took three forms, as exemplified in 7

- 7 a. All of the Simpsons are not on skateboards.
 b. Not all of the Simpsons are on skateboards.
 c. None of the Simpsons are on skateboards.

Each of these sentences was combined with the three picture types to provide a total of nine experimental conditions, which varied with respect to their matching (that is, whether or not the sentence is an appropriate description of the context), as demonstrated in table 2. For each experimental condition 6 examples were presented, giving a total of 54 experimental items.

Sentence	Context	Sentence-Picture Pair
All of the Simpsons are not on skateboards.	Picture 1	Mismatch
All of the Simpsons are not on skateboards.	Picture 2	Match/Mismatch
All of the Simpsons are not on skateboards.	Picture 3	Match
Not all of the Simpsons are on skateboards.	Picture 1	Mismatch
Not all of the Simpsons are on skateboards.	Picture 2	Match
Not all of the Simpsons are on skateboards.	Picture 3	Match/Mismatch ⁶
None of the Simpsons are on skateboards.	Picture 1	Mismatch
None of the Simpsons are on skateboards.	Picture 2	Mismatch
None of the Simpsons are on skateboards.	Picture 3	Match

Table 2

3.1.2.3 Procedure

The children were tested either at home or in a quiet room at school by an experimenter who was familiar to them. They were told that they would be shown some pictures and

⁶The judgement of this condition appears to be optional for all the subjects, though this was not expected. For further discussion, I refer the reader to experiment 5, section 3.5.

then hear a sentence that described them. The children were instructed to listen carefully to the sentence and decide whether or not the description was correct. Then they were asked to tell the experimenter why they made this judgement.

The experimenter was seated next to the child and presented them with each picture in turn. The test sentences which accompanied the pictures were pre-recorded by the examiner to maintain a consistent presentation, and the children's responses were audio-recorded on a Sony DAT recorder using an Electret Condenser Microphone (ECM-959), positioned approximately 20cm to the side of the child's mouth. From these recordings, detailed transcriptions were made and then checked by a fellow linguistics graduate student for accuracy (see Appendix 1).

The presentation of the 54 experimental items was preceded by 4 practice items, which ensured that the child understood the demands of the task. The instructions used at the beginning of each session are given in 8:

8. In a moment I am going to show you a picture. I want you to look at it carefully and then I will play a tape. The tape will say something about the picture. I want you to tell me whether or not what the tape says is right. Then I want you to tell me why you think that. First we are going to have a practice, and I will help you.

The test presentation took place in a set random order.

3.1.3 Results

The Sentences produced by the children in the study overwhelmingly took the form of simple affirmative and negative sentences, as exemplified in 9. The test stimuli naturally elicited responses containing auxiliary or copular verb forms.

- 9 a. They are(n't) on their skateboards
 b. They do (not) have hats.

In addition to these 'simple' constructions a number of conjoined sentences were also produced (exemplified in 10.)

- 10 a. They are(n't) on their skateboards and He is(n't)
 b. He does (not) have a hat and They do (not) have hats

For the purposes of my initial analysis, I will examine only the children's production of simple sentences, returning to an examination of the conjoined sentences in section 3.1.3.2

2.1 Production of simple sentences

The overall mean grammatical responses across the groups was 93.01% (8.61SD, range 78.5-98.3). The percentages of grammatical responses for each group across the sub-condition of sentence type (positive or negative) are given in table 3.

	SLI	LA1	LA2	LA3
Positive sentences	82%	97%	97%	97%
Negative sentences	75%	99.6%	97.5%	99%

Table 3.

3.1.3.1.1 Sentence type analysis.

First, let's look at the effect of the sentence type (affirmative vs. negative) on the group performances. The data were analysed in a 4(Group: SLI, LA1, LA2, LA3) x 2(Sentence type: Affirmative, Negative) ANOVA by subject, treating Group as a between-subjects factor and Sentence type as a within-subjects factor. There was a significant main effect of Group ($F(3,43) = 18.22, p < .0001$), but the main effect of Sentence type was not significant ($F(1,43) = .27, p = .603$). The interaction of Group and Sentence type was marginally significant ($F(1,43) = 2.61, p = .063$).

To further investigate the main effect of Group, a planned comparison was carried out. This analysis revealed that the SLI group produced significantly fewer grammatical sentences than the LA control groups ($F(1,43) = 35.29, p < .0001$, SLI vs. LA1; $F(1,43) = 32.05, p < .0001$, SLI vs. LA2; $F(1,43) = 35.31, p < .0001$, SLI vs. LA3). The failure of the main effect of Sentence type to achieve significance reflected the fact that similar proportions of both sentence types were produced grammatically within groups.

Further analysis of the marginal Group x Sentence type interaction revealed that the SLI subjects produced a significantly smaller proportion of grammatical sentences for both sentence types (SLI vs. LA groups affirmative sentences: $F(1,43) = 20.98, p <$

.0001; negative sentences: $F(1,43) = 51.81, p < .0001$). In addition, no single group was found to produce a higher proportion of either sentence type grammatically (SLI: $t(13) = 1.74, p = .106$; LA1: $t(10) = 1.39, p = .196$; LA2: $t(10) = .72, p = .488$; LA3: $t(10) = 1.36, p = .203$). This was consistent with the finding that Sentence type was not a significant factor in predicting the grammaticality of sentences.

3.1.3.1.2 Negative sentence analysis

Two forms of the negative particle *not* were used. An analysis was conducted to consider the effect of this variable on the group performances. The data were analysed in a 4 (Group: SLI, LA1, LA2, LA3) x 2 (Particle type: Contracted, Non-contracted) ANOVA by subject. Group was the between-subjects factor and Particle type was the within-subjects factor. There was a significant main effect of Group ($F(3,43) = 15.78, p < .0001$), but neither the main effect of Particle type nor the interaction of Group with Particle type achieved significance (Particle type: $F(1,43) = .26, p = .613$; Group x Particle type: $F(3,43) = 1.06, p = .377$).

The main effect of Group was further investigated through a planned comparison. This revealed that the SLI children produced a significantly smaller proportion of grammatical negative sentences than any of the control groups ($F(1,43) = 30.08, p < .0001$, SLI vs. LA1; $F(1,43) = 29.44, p < .0001$, SLI vs. LA2; $F(1,43) = 29.45, p < .0001$, SLI vs. LA3)⁷. The failure of the effect of Particle type and the interaction of Group with Particle type to achieve significance reflected the fact that Particle type was not a factor in the performance of any of the groups' production of negative sentences.

3.1.3.1.3 Error analysis

In this section I will consider the type of errors that the SLI group produced. Given the size of the data sample it would not be reasonable to conduct a statistical analysis on the individual means of the SLI group; as such I will consider the data given in table 4:

⁷Neither of the planned comparisons of Group in sections 3.1.3.1.1 and 3.1.3.1.2 revealed any significant effect of Group between the LA groups.

	Error Type		
	Omission/commission of Neg particle	Omission of auxiliary/copula	Commission of auxiliary/copula
Affirmative sentences n = 80	0	75 (93.75)	5 (6.25)
Negative sentences n = 61	0	33 (53.22)	28 (46.77)

Table 4: Breakdown of SLI group's errors for simple affirmative and negative sentences. (Percentages in brackets)

Firstly, if we consider the production of the negative particle, we can see that none of the errors reflect either the commission of *not* when an affirmative sentence was targeted, or its omission when a negative sentence was targeted. As discussed, the task permitted an accurate evaluation of the speaker's intentions in this respect. The data reveal that errors universally⁸ took the form of problematic insertion of a copular or auxiliary verb form.

An examination of the SLI group's production of affirmative sentence reveals that errors in this domain overwhelmingly took the form of *omissions* of obligatory auxiliary and copular verbs. These accounted for over 93% of the group's errors in the production of simple affirmative sentences and constituted 16.6% of the active sentences produced by the group as a whole.

In contrast, the errors produced by the SLI group when they formed negative sentences revealed quite a different pattern. Only 53.22% of the errors in negative sentences were omissions of auxiliary or copular verbs, while the remaining 46.77% took the form of commissions of inappropriate forms in these contexts. Examples of sentences containing omission and commission errors are given in 11.

- | | | |
|----|-------------------------------------|--------------------------------|
| 11 | a. They all skipping | Affirmative omission (SLI 4) |
| | b. The hats is on top of each other | Affirmative commission (SLI 7) |
| | c. They not on it | Negative omission (SLI 5) |
| | d. A Simpson aren't skipping | Negative commission (SLI 11) |

⁸The type of pictures used in the task mostly elicited sentences containing auxiliary or copular verb forms (with very few exceptions). There were a (small) number of subject case errors, see appendix 1.

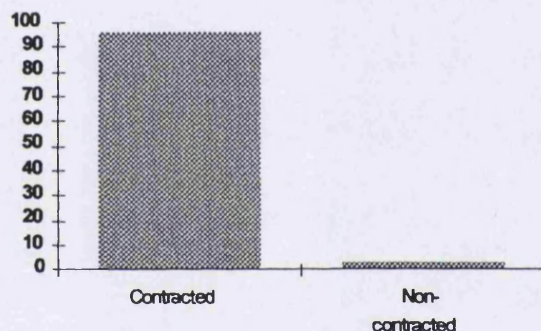
Given the different distribution of error types between affirmative and negative sentences I investigated the possible cause of this asymmetry. An examination of the effect of contraction on error type yielded the results in Table 5:

	Error Type	
	Omission	Commission
Contracted	0 (0)	27 (96.4)
Non-contracted	33 (100)	1 (3.6)

Table 5: the number of each type of error (omission vs. commission) which occurred in each sentence type (contracted vs. non-contracted). Percentages are in brackets.

As can be seen from Table 6 a striking asymmetry exists in the distribution of the commission errors⁹ Their occurrence overwhelmingly coincides with the insertion of a contracted negative particle, as demonstrated in figure 2:

Figure 2. Distribution of commission errors.



3.1.3.1.4 Summary: Simple sentences

The main effects of Group, Sentence type, and Contraction were considered in a pair of two-way ANOVAs (Group x Sentence type and Group x Contraction) by subject. In both analyses, only the main effect of Group was significant, reflecting the fact that the SLI children produced a lower proportion of their sentences grammatically. The failure of Sentence type and Contraction to achieve significance reflected the fact that they did not significantly affect the grammaticality of the sentences.

An analysis of error type was carried out on the ungrammatical sentences. This revealed that an asymmetry existed between affirmative and negative sentences. While

⁹An omission error is not possible with a contracted negative particle.

commission errors were rare in affirmative sentences they accounted for almost ??the errors in negative sentences and further analysis revealed that the occurrence of commission errors coincided with the insertion of a contracted negative particle.

3.1.3.2 Conjoined sentences.

As mentioned earlier, in addition to simple affirmative and negative sentences, a small number of conjoined sentences were produced. Table 6 provides the raw data for the production of these sentences.

Table 6.

a. Production of conjoined sentences.

Group	Total	Grammatical	Errors	
			Omission	Commission
SLI (n=14)	93	53 (57%)	6 (6.5%)	34 (34.5%)
LA1 (n=11)	59	56 (95%)	2 (3.3%)	1 (1.7%)
LA2 (n=11)	48	43 (90%)	1 (2%)	4 (8%)
LA3 (n=11)	45	40 (89%)	0	5 (11%)

b. Raw data for SLI group's production of conjoined sentences.

Subject	Total conjoined sentences*	Grammatical	Omission errors		Commission errors		Other
			Type 1	Type 2	Type 3	Type 4	
SLI1	5 (10)	0		3		1	1
SLI2	0	n/a					
SLI3	0	n/a					
SLI4	4 (8)	4					
SLI5	14 (28)	7			6		1
SLI6	0	n/a					
SLI7	4 (8)	4					
SLI8	11 (22)	10				1	
SLI9	0	n/a					
SLI10	4 (8)	3					1
SLI11	9 (18)	5			4		
SLI12	19 (38)	5			13	1	
SLI13	17 (34)	14				2	1
SLI14	6 (12)	1			5		

* Figures in brackets denote number of auxiliary/copulas.

Errors were coded as follows:

- Error type 1 indicates that an obligatory auxiliary/copular verb had been omitted in an affirmative context but appeared in the negative context (exemplified in 12a).

- Error type 2 indicates that the auxiliary/copular verb is omitted from the negative context but appears in the affirmative context (exemplified in 12b).
- Error type 3 indicates that an inappropriate form of the auxiliary/copular verb surfaced in the affirmative context (exemplified in 12c).
- Error type 4 indicates that an inappropriate form of the auxiliary/copular verb surfaced in the negative context (exemplified in 12d).

- 12 a. *He on the skateboard and they aren't. (not attested)
 b. *Two of them have hats and one not (SLI 11)
 c. *Two is wearing a hat and one isn't (SLI 8)
 d. *Two of em are skipping, one of em aren't (SLI 11)

Errors in the 'Other' column were cases where either both the auxiliaries were omitted (as in 13a), or both the auxiliaries were in an affirmative context (as in 13b).

- 13 a. Two people got the balloons and one of em not (SLI 11)
 b. One's standing and two running (SLI 10)

The vast majority of these sentences were produced when picture type 2 was presented. Picture type 2 depicted two of the three individuals holding a property and the third not. A total of 245 conjoined sentences were produced, of which the SLI group produced 93. Because of the small number of sentences involved, and the considerable variation across subjects with respect to their distribution, it would not be reasonable to conduct a statistical analysis of these data. However, even a preliminary examination of the data in table 6a reveals a considerable difference in the performance of the SLI group when compared to that of their controls.

The SLI children produced only 57% of their conjoined sentences correctly, while the controls produced 89-95% correctly. While this finding mirrors the cross-group contrast found in the analysis of simple sentences, note that a considerably larger proportion of the conjoined sentences were ungrammatical (43% vs. 21.5% for conjoined and simple sentences respectively). In addition, the SLI children produced a large number of commission errors relative to omission errors, accounting for 34.5% and 6.5% of the

data respectively, whereas in the simple sentence analysis the tendency was in the other direction¹⁰. Table 6b provides a breakdown of these errors¹¹.

Table 6b reveals a contrast between error types 3 and 4. While an equal number of children produced errors of each type, there were considerably more type 3 errors (28 type 3 vs. 5 type 4). This reflected a tendency for the commission errors to occur in the affirmative context of the conjoined sentences (as in example 12c.). This is in stark contrast to the findings for simple sentences where almost all commission errors occurred in negative contexts.

3.1.3.2.1 Summary of conjoined sentences

To summarise, as in the analysis of simple sentences, a considerable difference was found between the SLI group's performance and that of their controls. The SLI group produced a far greater proportion of their sentences ungrammatically.

Further examination of the data revealed that these errors were for the main part commissions in affirmative contexts. This contrasted with findings for simple sentences where there was a more even distribution of errors across omissions and commissions, and errors of commission almost universally appeared in negative contexts.

3.1.3 Discussion

First consider the findings for simple sentences. There is a clear effect of Group which is apparent in both the analysis of Sentence type and Contraction. The SLI children are found to perform significantly worse than any of their control groups. Analysis of the SLI group's errors appeared to demonstrate that the omission of the negative particle was not an option for the children, and this was further supported by an examination of the contexts in which the utterances were produced.

Errors in the production of affirmative sentences were found to be overwhelmingly omissions of obligatory auxiliary and copular verbs, which was consistent with findings from previous studies (cf. Bishop, 1994) as well as with the

¹⁰Though note that both of the older LA groups (LA2 and LA3) produced a larger proportion of commission errors.

¹¹Note that the variation in the group's performance is clearly apparent, with only a subset of the group producing any single type of error.

predictions of Generalisation 2¹². However, an analysis of the errors in negative sentences revealed that a large proportion were commissions of inappropriate auxiliary and copular forms. This finding was interesting because it seemed to indicate a difference between the children's production of affirmative sentences and their production of negatives.

Further examination of the distribution of the errors in negative sentences revealed another striking regularity in their distribution. A relation was found between the occurrence of the commission errors and the children's use of the reduced negative particle *n't*. As discussed in section 3.1.1, I assume an analysis of the reduced negative particle which suggests that it forms a single lexical word with its host verb. Given this analysis, and the finding that the requirement for the negative particle still remains in the SLI child's grammar, it seems plausible that the auxiliary is also omitted in these cases. However, because it forms part of a single word with the negative it remains as a dummy element which carries no informational content. This analysis seems plausible, given the extremely restrictive occurrence of these errors. However, I will return to consider it further in my discussion in Chapter 4.

Now let's consider the data from conjoined sentences. Firstly, it is important to re-emphasise how small this data sample is and the extensive variation that exists in individual SLI children's performance. As a result, any conclusions drawn from this analysis must be extremely tentative. Perhaps the most striking aspect of the data results from a comparison with the children's performance on simple sentences. First, the children's deficit seems to be far more pronounced. They produce a considerably larger proportion of their conjoined sentences incorrectly; 43% for conjoined sentences vs. 21.5% for simple sentences. This result is to some extent misleading: if we take into account the fact that the production of each conjoined sentence involves the insertion of two auxiliary/copular verbs, then the difference becomes more easy to explain. Indeed, with only a single exception, all of the conjoined sentences produced by the SLI group contained at least one appropriately inserted verb form.

Next consider the nature of the children's errors, these are illustrated in figure 3:

¹²In this respect the analysis of the simple affirmative sentences provided a valuable control for the experimental findings.

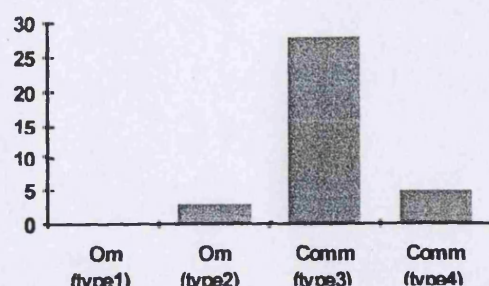


Figure 3. Distribution of errors in conjoined sentences

If we consider these results we find two interesting areas of contrast with the results from simple sentences. First, there is a far larger proportion of commission errors than omission errors (types 1 and 2 vs. 3 and 4). This contrasts with the findings for simple sentences where the proportions were roughly equal. Second, a large proportion of these commission errors occurred in the affirmative part of the sentence (type 3 errors). This finding is extremely significant since there were very few commission errors in the simple affirmative sentences, and the analysis I formulated was dependent upon there being a link between commissions and the insertion of the contracted negative particle.¹³ The question that now arises is whether this analysis can be maintained in light of this new data.

There are two aspects of the data that suggests that this is possible and perhaps motivated. The first relates to the fact that there is no apparent reason why the nature of errors in the insertion of auxiliary/copular verbs should differ as a factor of whether or not they occur in simple or conjoined sentences. The fact that on the whole errors of commission seem only to occur in affirmative sentences when they are conjoined to another sentence suggests that this cannot simply be a free option for the children. A second observation is that all the errors of commission occurred when the child used the contracted form of the negative particle, either with an inappropriate verb form (type 4 errors) or with the correct verb form conjoined to an affirmative with an inappropriate form (type 3 errors). The data are presented in table 7.

¹³It should be noted that an equal number of the children produced type 3 and type 4 errors (4 in both cases), but only one child (SLI 8) produced errors of both types, thus demonstrating the variation in the group.

Negation type	Error type	
	Omission	Commission
<i>not</i> (n = 23)	3	0
<i>n't</i> (n = 66)	0	33

Table 7. Distribution of errors by negation in conjoined sentences.

The correlation between the child's use of the contracted particle and their production of commission errors seems to mirror the findings for simple sentences. It is of note that all of the 28 commissions in the affirmative part of the sentence (type 3 errors, see table 6b) used the same form of the auxiliary/copular verb as was used appropriately in the conjoined negative sentence (exemplified in 14)

14 *Two has got hats and one hasn't.

Although caution is expressed with the interpretation of these data, they suggest that the commission errors in the production of conjoined sentences were restricted in some way, and that the link I drew between their occurrence and the child's use of the contracted negative particle could still be valid. If this is the case then how can this data be accommodated by my analysis?

It is possible that, in the cases where a contracted negative particle is selected, the SLI child uses this verb form in the conjoined affirmative as well, rather than omitting the verb altogether. It is an interesting observation that none of the children produced type 1 errors, where the verb in the affirmative is omitted while it is specified in the negative (see 12a. repeated as 15a. below), or the type of error in 15b, where the verb is inappropriate in the negative sentence and omitted in the conjoined affirmative¹⁴.

15 a. *He on the skateboard and they aren't

 b. *He on the skateboard and they isn't

There is no principled reason why the omission of the verb form in the affirmative part of the sentence would be ruled out in these data. The analysis of simple affirmative sentences revealed that auxiliary/copular verb forms were omitted over 16% of the time.

¹⁴Omissions as a whole were rare, only occurring three times in the production of a single subject.

This seems to support the possibility that, in the cases where an auxiliary/copular form is not specified for the affirmative sentence, the verb from the conjoined negative is used.

There are a number of aspects which are not fully explained by this proposal. For example, there would be no reason to expect such a large proportion of the commission errors to occur in the affirmative part of the sentence as opposed to the negative part. However, because of the size of the data sample I will maintain this proposal.

A final observation, which holds across both analyses, relates to the nature of the commission errors. Errors of commission are always related to inappropriate specification of tense or agreement, never to the 'semantic' identity of the verb. Thus errors of the form in 16a were observed, but not of the form in 16b:

- 16 a. *They hasn't got hats.
 b. *They isn't got hats.

This seems to indicate that the SLI children were aware of the semantic difference between the different forms of the verbs.

To summarise, the data from this experiment are consistent with Generalisation 2. Errors either take the form of the omission of the obligatory auxiliary and copular verbs, or the commission of the verbs in inappropriate forms when a contracted negative particle was used. It was argued that commission errors were licensed when the reduced form of the negative particle was used because its attachment to the verb form was a lexical process.

3.2 Experiment 2

3.2.1 Method

3.2.1.1 Design and Subjects

The data examined in this section were collected in the same session as those in Experiment 1. I refer the reader to the previous section for a detailed description of the subject groups and the experimental design. However, for ease of exposition I'll provide a brief outline here.

Four subject groups participated in this experiment: a group of SLI subjects and three control groups of younger children who were matched for a range of language abilities.

The aim of the experiment was to assess SLI children's ability to comprehend negative sentences. The children were presented with a picture and then asked to listen to a sentence which described this picture. They were asked to judge whether the description was accurate and then to provide an explanation of their judgement. The explanation was invariably made with reference to the picture and took a descriptive form. This had a two-fold role. First, it allowed me to elicit the data for experiment 1 which analysed the children's ability to produce negative sentences and, second, it allowed me to cross-check the children's responses to ensure that they both understood the task and also remained attentive.

Three types of pictures were used. In picture type 1, all three individuals were depicted holding a specific property. In picture type 2, only a sub-set of them held this property; and in picture type 3, none of them held the property. In all cases the only variant was the test condition.

The test sentences, which were provided as descriptions of the pictures, also took three forms, as exemplified in 7, repeated here as 17:

- 17 a. All of the Simpsons are not wearing hats.
 b. Not all of the Simpsons are wearing hats.
 c. None of the Simpsons are wearing hats.

Each of these sentences were combined with the three picture types to provide a total of nine experimental conditions, which varied with respect to their matching, as demonstrated in table 3 (above). For each experimental condition, 6 examples were presented, giving a total of 54 experimental items.

3.2.2 Results

The overall mean correct responses across the groups was 91.0% (8.1 SD). The percentages of correct responses for each group are given in table 8:

		SLI	LA1	LA2	LA3
Sentence type 1 (n=12) ¹⁵	<i>n</i> correct	10.5 (1.8)	10.2 (2.2)	11.2 (0.8)	11.7 (0.5)
	% correct	87.5 (15.4)	85.1 (18.4)	93.1 (6.7)	97.2 (3.9)
Sentence type 2 (n=12)	<i>n</i> correct	10.7 (8.1)	9.8 (2.2)	11.7 (0.6)	11.3 (0.6)
	% correct	88.9 (15.0)	81.5 (18.4)	97.2 (5.2)	94.4 (5.2)
Sentence type 3 (n=18)	<i>n</i> correct	16.3 (1.6)	15.0 (2.8)	17.1 (1.4)	17.6 (0.6)
	% correct	90.3 (9.1)	83.3 (15.7)	94.9 (8.0)	97.7 (3.6)

Table 8: Standard deviations are in brackets.

3.2.2.1 Data analysis

The Group performances were investigated using a 4(Group: SLI, LA1, LA2, LA3) x 3(Neg type: Qneg, NegQ, None¹⁶) x 3(Picture type: pic1, pic2, pic3) x 2(Verb type: are, have) ANOVA by subject. Significant main effects for Group and Verb type were found (Group, $F(3,46) = 3.22$, $p < .05$; Verb type, $F(1,46) = 6.31$, $p < .05$), but the main effects for Neg type and Picture type were not significant (Neg type, $F(2,92) = .24$, $p = .787$; Picture type, $F(2,92) = 1.94$, $p = .150$)

To further investigate the main effect of Group, a planned comparison was carried out. This analysis revealed that the performance of the SLI group did not significantly differ from that of either the LA2 or LA3 groups $F(1,46) = .09$, $p = .445$, but that they produced significantly more correct responses than the LA1 controls $F(1,46) = 4.17$, $p = .047$, who were also significantly worse than both of the older language control groups $F(1,46) = 9.02$, $p = .004$.

The significant main effect of Verb type reflected the fact that significantly more correct responses were given to experimental items containing the verb *are* than for items containing *have* $t(49) = 2.50$, $p < .05$. However, the interaction of Verb type and group was not significant, reflecting the fact that Verb type was not a significant between-subjects factor.

¹⁵ Note, the first two sentence types have fewer exemplars than the third. This is because they both contained ambiguous contexts, which were excluded from this analysis.

¹⁶ Corresponding to 17 a, b, and c, respectively.

The interaction of Negation type and Picture type was significant ($F(4,184) = 9.31, p < .0001$). This reflected the fact that significantly more correct responses were given for 'none' sentences (exemplified in 17c.) when they were presented with picture type 1 than were given for either 'none' sentences when they were presented with picture type 2 ($t(49) = 2.39, p < .05$), or 'all not' sentences (see 17a.) when they were presented with picture type 1 ($t(49) = 3.88, p < .0001$). The interaction of Group, Negation and Picture type was not significant ($F(12,184) = .96, p = .491$).

The interaction of Picture type and Verb type was significant ($F(2,92) = 3.95, p < .05$). Further analysis revealed that significantly more correct responses were given to experimental items containing the verb *are* when it was presented with picture types 1 and 2 than when it was presented with picture type 3 ($t(49) = 2.17, p < .05$ and $t(49) = 2.18, p < .05$, respectively). Also, when Picture types 1 and 2 were presented, significantly more correct responses were given to experimental items containing the verb *are* than to items containing the verb *have* ($t(49) = 2.61, p < .05$ and $t(49) = 3.21, p < .005$, respectively). The interaction of Group, Picture type and Verb type was not significant ($F(6,92) = .25, p = .959$).

Finally, the interaction between Negation, Picture type and Verb type was significant ($F(4,184) = 5.22, p < .005$). However, as with the other interactions, the between subject interaction of Group by Negation, Picture type and Verb type was not significant ($F(12,184) = 1.21, p = .282$).

3.2.2.2 Summary of findings for Experiment 2.

There was a significant main effect of Group, which reflected the fact that the LA1 group performed significantly worse than either the SLI group or the two older control groups. The SLI group's performance did not significantly differ from that of the older groups. There was a significant main effect of Verb type, but the interaction of Verb type and Group was not significant. Similarly, there were a number of significant interactions; Negation type x Picture type, Picture type x Verb type, Negation type x Picture type x Verb type, but these significant interactions were restricted to the within-subject factors, their interaction with Group never proving significant.

3.2.2.3 Discussion

The correct judgement of the items in Experiment 2 was crucially dependent upon the children's ability to interpret the negation in the sentence. In Experiment 1, it was observed that production of the negative particles was not problematic for the children, and as such we would not expect the interpretation of negation to present them with difficulties. The findings for Experiment 2 are consistent with this prediction, the SLI children performed as well as both the LA2 and LA3 control groups and better than the LA1 group.

The significance of the main effect of Verb type suggests that the groups found it harder to interpret items containing the verb *have* than those containing *be*. However, since this holds for all the groups, it is not of concern to our present discussion. The fact that the main effect of Negation type did not achieve significance suggests that both the position of the negative particle (contrasted in 17a and 17b) and the contrast between the use of the *none* and *not* were not significant factors in the children's performance.

3.3 Experiment 3 : THE PRODUCTION OF NEGATIVE QUESTIONS.

3.3.1 The formation of negative questions

In this experiment I investigated the SLI children's ability to formulate simple (matrix), negative questions. In this, I followed a number of earlier investigators who have examined children's abilities with affirmative questions (cf. Smith, 1992; and Batell, 1998). First I will discuss the syntactic analysis of question formation which I will assume here, starting with object questions. The derivation of an object question such as the one exemplified in 18 involves two movement processes.

- 18 a. What did Edna eat?
 b. [_{CP} What_i [_C did_j [_{IP} Edna [_I t_j [_{VP} [_V eat [_{NP} t_i ?]]]]]]]

The first of these raises the wh-operator *what* from the VP internal object position to the spec of CP. This process leaves a trace in the object position which is bound by the Wh-operator. The second movement process raises the auxiliary, which is obligatorily inserted in object questions (do-support) from the head of IP to the head of

CP, again leaving a trace which occupies this position. Note that in the object question the auxiliary verb marks tense, while the matrix verb surfaces in its non-finite form.

In a *negative* object question, exemplified in 19a and b, a negative particle is also inserted. The negative particle has two forms: *not*, and the reduced *n't* which is attached to an auxiliary verb.

- 19 a. What does Edna not eat?
 b. What doesn't Edna eat?

As can be seen from 19, when the negative particle is reduced it raises to the head of CP along with the attached auxiliary verb. In contrast, if the full form of the particle is used then it remains in situ with raising resulting in ungrammaticality (see 20)

- 20 *What does not Edna eat?

If we now turn to the derivation of subject questions, we can see that there are a number of significant differences. First, the derivation of subject questions does not incur do-support, with tense typically being marked on the matrix verb. Secondly, the movement of the subject from its VP internal base position to the spec of CP does not result in an overt change in word order, as exemplified in 21:

- 21 a. Who eats rhubarb?
 b. [_{CP} Who_i [_C [_{IP} t_i [_{I'} [_{VP} [_{V'} eats rhubarb?]]]]]]]

If the subject question is *negative*, however, do-insertion is required, for independent reasons (see the general discussion of negative sentences from Epstein at the beginning of this chapter). The examples given in 22 are negative subject questions with *not* and *n't* respectively.

- 22 a. Who does not eat rhubarb?
 b. Who doesn't eat rhubarb?

Here we can see that, in contrast to object questions, there is no overt change in word order on the basis of the form of negative particle used. However, I will assume that the

auxiliary undergoes I to C movement in these cases as it does in object questions and, accordingly, that when the negative particle is attached to the auxiliary, this also raises, although this stance is not crucial to my analysis.

In accordance with the analysis outlined in the previous chapter, the focus of this experiment will be on the movement processes involved in the production of negative questions. I will be looking for evidence for or against the central thesis that movement may characterise these children's language abilities.

3.3.2 Design

The aim of this experiment was to elicit negative subject and object questions. The elicitation of such complex structures is very difficult, especially given the SLI child's tendency to employ strategies to avoid such constructs in their normal speech. In this experiment I employed a question-response task. The children were informed that I knew something was absent from a picture and then asked to inquire what this was. The task was designed to elicit both subject and object questions and questions containing the verbs *be* and *have*.

3.3.2.1 Subjects

Four subject groups participated in the experiment: a group of SLI subjects and three groups of younger children who provided control groups matched on the basis of three different tests of language abilities (LA controls)¹⁷. These subject groups are identical to those studied in the previous two experiments. For subject details, I refer the reader to section 3.1.2.1.

3.3.3 Results

The analysis of negative question production will take place in two parts. First, I will consider a statistical analysis of the SLI children's performance as compared to the LA control groups. Second, I will give a breakdown of the types of errors the children produced and consider analyses of the data.

¹⁷In addition to the three LA control groups, a group of age-matched subjects also participated in the experiment. The results from this group will not be included in the analysis as they did not produce any errors.

The mean grammatical responses were analysed through a 4 Group (SLI; LA1; LA2; LA3) x 2 Question type (Subject question; Object question) x 2 Verb type (*be*; *have*) ANOVA by Subject. Significant main effects for Group ($F(3,42) = 39.75$; $p < .0001$) and Question type ($F(1,42) = 20.62$; $p < .0001$) were revealed, but the main effect of Verb type ($F(1,42) = .50$; $p = .485$) was not significant, reflecting the fact that the type of verb used did not appear to affect the level of difficulty that the children experienced when producing the questions.

The significant main effect for Group was further investigated. This revealed that the SLI group produced a significantly smaller proportion of grammatical questions than any of the three LA groups¹⁸ (SLI vs. LA1: $F(1,42) = 74.64$; $p < .0001$; SLI vs. LA2: $F(1,42) = 77.70$; $p < .0001$; SLI vs. LA3: $F(1,42) = 76.17$; $p < .0001$).

The significant main effect of Question type was investigated. This revealed that significantly more errors were made in the production of object questions than were made in the production of subject questions $t(45) = 3.40$; $p < .005$. In addition, the interaction of Group and Question type was significant, suggesting that this was a between-subjects factor. A planned comparison was carried out. The analysis revealed that the SLI group performed significantly worse than the LA control groups on both subject and object questions (Subject questions: $F(1,42) = 108.26$; $p < .0001$; Object questions: $F(1,42) = 72.77$; $p < .0001$). In addition, while the SLI performance showed a significant effect of Question type, the children producing significantly more grammatical subject questions than object questions ($t(12) = 5.09$; $p < .0001$) the within-subject factor of Question type did not prove to be significant for any of the LA groups (LA1: $t(10) = .56$; $p = .588$; LA2: $t(10) = 1.00$; $p = .341$; LA3: $t(10) = .00$; $p = 1.000$). This was to be expected, however, since the control groups appear to be performing at or near to ceiling on this task.

The interaction of Group and Verb type was not significant ($F(3,42) = .09$; $p = .963$) reflecting the fact that the verb type was not a significant factor in any of the group performances. The interaction of Question type and Verb type also did not achieve significance ($F(1,42) = .08$; $p = .780$) and nor did the 3-way interaction of Group, Question type and Verb type ($F(3,42) = .74$; $p = .533$).

¹⁸The use of the term 'grammatical' here includes the cases where the children produced affirmative questions inappropriately.

3.3.3.1 Summary of statistical analysis

In the analysis, Group was taken as the between-subjects factor and Question type and Verb type as the within-subjects factors. There was a significant main effect of Group. This reflected the fact that the SLI children were producing significantly fewer grammatical questions than their LA controls. The main effect of Question type was significant, as was the interaction of Question type and Group. This was found to reflect the fact the SLI children produced significantly more ungrammatical object questions than subject questions. The finding that the children produced significantly fewer errors for subject question than for object questions is consistent with findings from previous studies of question production in SLI (cf. Battell 1998). This asymmetry is a little surprising, given research which suggests that in normal development children acquire object questions at the same time, or earlier than subject questions (Stromswold, 1994). This has implications for the view that SLI represents a delay in a normal acquisitional process, as argued by researchers such as Rice et al. (1995) for the EOI model. The fact that object questions cause more difficulty seems to relate directly to their syntactic complexity, rather than to any developmental pattern.

Finally, the main effect of Verb type was not found to be a significant factor in any of the groups' performance.

3.3.3.2 Analysis by Error type

In addition to the statistical analysis provided in the previous section, in this section I will conduct a detailed analysis of the type of errors produced by the children.

Because the LA control groups produced very few ungrammatical questions of any type, an analysis of their errors would not be informative. Accordingly, I will focus upon the errors produced by the SLI group only.

As discussed, the derivation of subject and object questions differ fundamentally. As such, I will discuss the errors for each type of question separately, starting with the subject questions.

3.3.3.2.1 Errors in the production of object questions.

There were broadly four types of errors committed in the production of object questions. These were as follows: errors which related to the negative particle; errors which related to the auxiliary verb; errors which related to the wh-element; and errors where the SLI child produced an affirmative rather than negative question. These were categorized as error types 1-4 respectively and are represented in table 9, below:

Error type	Occurrences	Mean across groups
Type 1	31	2.38
Type 2	8	.62
Type 3	15	1.15
Type 4	27	2.08
Total	81	6.23

Table 9.

Broadly defined, type 1 errors relate to the negative particle. In the present data sample, these errors are mainly of the type exemplified in 23a and b. In this case, the normally obligatory movement process that raises the auxiliary verb and negative particle to the CP has not taken place. Errors of this form accounted for 23 of the 31 type 1 errors. The second error of this type, also saw the negative particle stranded in situ. However, in addition, the child doubled the auxiliary, as exemplified in 23c and d. These errors accounted for 5 of the 31 type 1 errors.

- 23 a. What the stork isn't doing? (SLI 6)
 b. What the duck hasn't got? (SLI 6)
 c. What does the stork doesn't have? (SLI 2)
 d. What does the man in the picture doesn't have? (SLI 3)

The analysis revealed that type 1 errors occurred most frequently (31 times). These errors were particularly significant because they related to the position of the negative particle in the sentence. In the type 1 errors exemplified in 23a and b it appears that the negative particle and auxiliary verb have failed to raise to the matrix CP position as is appropriate in object questions. This finding is somewhat strange given that most investigations into the use of auxiliary verbs suggests that they rarely occur in inappropriate positions, rather, it seems that when the auxiliary verb is problematic it is omitted (cf. Rice et al., 1995)

In an attempt to explain this apparent inconsistency, I appeal to the lexical analysis of negative particle contraction which I advocated in Experiment 1. If I follow

this analysis, then the emergence of the auxiliary verb in NegP relates directly to the fact that it is attached to the negative particle lexically, and when the negative is contracted a dummy form of the verb is inserted if the correct one is not specified. Under this analysis the auxiliary? verb has effectively been omitted and contains no informational content. It is a dummy element that has the sole role of supporting the reduced negative particle.

The other variant of type 1 errors, exemplified in 23 c and d, also supports this analysis. In this case, the negative particle and auxiliary verb once again surface in the NegP but, in addition, another auxiliary verb surfaces in the CP position. Given that the attached auxiliary is assumed to hold no informational content, it appears that, in these cases, while the negative particle fails to raise to the CP, the auxiliary verb has done so¹⁹. The fact that we do not find examples of double auxiliary structures with non-contracted forms of the negative particle also supports this analysis of the auxiliary verb as a ‘dummy’ element.

To summarise the main points, consider the following paradigm:

Figure 8: Type 1 error paradigm.

Forms		Attested
1	What isn't the clown wearing?	Y
2	What is the clown not wearing?	Y
3	*What the clown isn't wearing?	Y
4	*What the clown is not wearing?	N
5	*What is the clown isn't wearing?	Y
6	*What is the clown is not wearing?	N
7	*What the clown not is wearing?	N
8	*What the clown isn't is wearing?	N

Type 2 errors are those which related to the auxiliary verb. These also took two forms; the omission of an obligatory auxiliary verb (exemplified in 24a), accounting for 5 errors, and the commission of an inappropriate form (exemplified in 24b), accounting for 3 errors. Although there were only 3 auxiliary commission errors these were all accompanied by a contracted particle, and as such seem to be consistent with the findings in experiment1.

- 24
- a. What the clown not have? (SLI 2)

b. What haven't he got? (SLI 9)

¹⁹This is clearly a possibility, given that I allow for the possibility that the optional application of movement may act intra-sententially. See section 2.6 for discussion.

The main question regarding these errors was why there were so few of them. From the findings for simple actives, we would expect these errors to occur around 20% of the time. However, they accounted for only around 5% of the data. The infrequency of omission errors may relate to the large proportion of contracted negatives that were used, accounting for over 90% of the data. However, we would still expect to find commission errors associated with the contracted form of negation. The increased accuracy with regard to the auxiliary may relate to the fact that the probe always contained the correct form of the verb. In addition, the test items did not vary on the basis of the number of the verb required as was the case in Experiment 1, so this aspect was arguably easier for the SLI children.

The Type 3 errors related to the child's use of the *wh*-element. In this case, these concerned the ungrammatical filling of the trace position which is standardly assumed to be the origin of the *wh*-element in object questions. Errors of this type are exemplified in 25 a and b.

- 25 a. *What hasn't he got something? (SLI 9)
 b. *What is he not doing something? (SLI 9)

As discussed in the previous chapter, the SLI child's consistent production of sentence initial *wh*-elements does not appear to reflect unimpaired grammatical knowledge. Rather, it is suggested that the child consistently applies an explicitly learned strategy which instructs them that a *wh*-element should be sentence-initial in questions. As such, this position is not always derived by the child, and they are unaware that a trace should occupy the object position. This is supported by our observation of such gap-filling errors in which the SLI child appears to be able to fill the object position, suggesting that the sentence initial *wh*-element is not derived in these cases.

Finally, there was a fourth type of error. These were counted when the child produced an affirmative rather than a negative question. Type 4 errors took two forms. The first, which I'll call inappropriate affirmatives, were cases where the child seems to have simply omitted the negative particle, and were inappropriate given the probe. This is exemplified in 26:

26 Probe: The Knight doesn't have something. Ask me what?

Response: What does the Knight have? (SLI 7)

These accounted for 7 of the 27 type 4 errors. The second error of this type were the appropriate affirmatives. In this case the child also failed to produce a negative question, but the response was not inappropriate given the probe. This is exemplified in 27:

27. Probe: The stork hasn't got something. Ask me what?

Response: What is missing from the pelican? (SLI 13)

Here the child has been able to construct an affirmative question which appropriately responds to the probe. These accounted for some 20 of the 27 type 4 errors.

I did not expect to find instances of negative particle omission. In the analysis of simple negative sentences, neg omission was not found in a single case. However, the inappropriate affirmative sentences arguably involve this type of error. Although this is potentially worrying, the analysis of the LA group performances reveals that they also produced a small number of this type of error, so their occurrence should not be of too much concern. More interesting, perhaps, are the appropriate affirmatives which were the second most frequent error form in the data. Given the context created by the probe sentence, it should have been quite hard to construct an appropriate affirmative sentence. However, the SLI children did this relatively frequently, in stark contrast to their LA controls, none of whom employed this avoidance strategy.

The SLI children's ability to formulate responses which were less complex, while still appropriate, even when these were not the most salient possibility, is a reflection of their intellectual maturity. The application of such strategies arguably counts against processing analyses of the disorder, since they involve seemingly more non-linguistic processing.

3.3.3.2.2 Errors in the production of subject questions.

The errors committed in the production of subject questions were similar to those discussed in the previous section for object questions. This is with the exception of type

1 errors which were not observable in subject questions because neg movement is not overtly reflected by a change in word order.

For ease of exposition, I will use the same categorisation here as in the previous section. Table 10 gives the raw data and means for the 3 error types 2, 3, and 4:

Error type	Occurrences	Mean
Type 2	11	.85
Type 3	11	.85
Type 4	20	1.54
Total	42	3.24

Table 10

As I provided a detailed discussion of these same error types in the previous section, I will only briefly discuss them here.

Type 2 errors, which related to the child's use of the auxiliary verb, occurred just as infrequently in the production of subject questions as they did in the production of object questions. Although these errors accounted for a far higher proportion of the errors committed in subject questions, this was due rather more to the smaller number of errors committed than to any increase in their frequency. 28a and b illustrate subject questions with type 2 errors:

- 28 a *Who not on the bike? (SLI 11)
 b *Who haven't got a violin (SLI 11)

Again, auxiliary commission errors occurred only in the sentences where the contracted form of the negative particle was used.

Type 3 errors, relating to the wh-element, occurred in similar numbers in the production of subject questions as was observed for object questions. Examples of subject questions with type 3 errors are given in 29 a and b:

- 29 a *Who someone hasn't got shoes on? (SLI 14)
 b *What something should have a basket? (SLI 9)

In these examples, the trace position of the subject wh-phrase is filled by the non-specific nouns, *someone* and *something*. As with the type 3 errors in object questions, I will take this as an indication that the overt position of the wh-element is not derived in

these sentences. It is worth note that while the matrix subject position was filled in these cases, the VP internal subject position was not. This may have implications for the analysis I am assuming, since there would be no reason to expect this apparently arbitrary distribution given the VP internal subject hypothesis. However, this is only a small data sample and caution must be taken, especially when considering the *absence* of forms as evidence.

Type 4 errors were the most frequent made in the production of subject questions. These were counted when an affirmative question was substituted for the correct negative response. These are exemplified in 30:

30 a. Probe: Someone hasn't got a sword. Ask me who?

Response: Who has a sword? (SLI 2)

b. Probe: One of the mice hasn't got any cheese. Ask me which?

Response: What wants cheese? (SLI 13)

As with object questions, there was a strong tendency towards the appropriate affirmatives; that is affirmatives which were correct given the context (see 30a.) If we consider the distribution and frequency of the errors across both question types (subject and object). It is of note that the number of errors for each type does not differ considerably on the basis of the question type. Rather the fact that there were more errors in the production of object question seems to be due to the fact that type 1 errors were not attested. This finding is quite significant because it bears on the question of complexity. If we hold to a general complexity view as advocated by researchers like Leonard(1992) then we would suggest that as the complexity of a sentence increases, a higher proportion of vulnerable elements should be omitted. If we take the present contrast, between subject and object questions, it seems clear that processing accounts should predict that a higher proportion of each vulnerable element would be omitted from object questions, since these are more complex. However, this does not appear to be the case. The findings presented here suggest that the occurrence of a single error type is stable irrespective of the overall complexity of the sentence and that the increase in errors as complexity increases is not proportional. Rather it reflects the fact that there are more things to go wrong.

3.4 Experiment 4: Grammaticality Judgement

3.4.1 Experimental Design

In this experiment I examined SLI children's grammaticality judgements on a range of Negative constructions. My reason for focussing on grammaticality judgements is that, in this domain, the proposals I hoped to evaluate make clear and diverging predictions. My choice to examine negative constructions is significant because the verb in English remains in situ in most overt contexts. As such, negation provides a valuable diagnostic for the absence of verb movement. It is standardly assumed that the negative head blocks covert raising of the matrix verb (or its formal features) and thus requires an auxiliary form to raise in the overt syntax, as exemplified in the clausal representation in 31

31 [_C Who [_I is_i [_{NegP} not [_{VP} t_i running?]]]]

In addition, when we consider negative object questions, depending on whether the negative particle is in its contracted or non-contracted form, it will undergo subject auxiliary inversion with the host verb. Consider the contrasts in 32

- 32 a Who didn't Betty hit?
 b Who did Betty not hit?
 c *Who did not Betty hit?

I examine three main effects in addition to the between subjects factor of Group. The first is Grammaticality. This allows me to compare the children's performance on grammatical and ungrammatical conditions. As discussed, it is a key prediction of the PCA that the SLI child will have comparable difficulty in the judgement of both grammatical and ungrammatical forms. The second main effect is Contraction. The experimental conditions differ on the basis of whether the negative particle is in its contracted or non-contracted form. As discussed, this has implications for the position of the negative particle in some interrogatives while critically not in others. Thirdly, the Force of a sentence will provide a main effect. Experimental conditions will differ on the basis of whether they have declarative or interrogative force, with interrogative force further subdivided on the basis of whether the condition is a subject or object question.

The relevant implication of force relates to the position of the auxiliary verb and interacts with the effect of contraction with respect to the position of the negative particle.

3.4.2 Method

3.4.2.1 Subjects

Five subject groups participated in the experiment: a group of SLI subjects, three control groups of younger children matched for different language abilities, and a control group matched for chronological age and non-linguistic cognitive abilities.

3.4.2.1.1 Specifically language impaired subjects

Ten subjects, aged between 12:11 and 18:10 (mean 15:3), participated in the study²⁰. All the subjects had been classified as “Grammatical SLI” as detailed in van der Lely, 1996, van der Lely and Stollwerck, 1996, using standardised tests and non-standardised procedures designed to assess the group’s grammatical abilities (e.g. tense and agreement marking, thematic role and reference assignment).

With respect to the present study, the children have received a certain amount of tuition on question formation, and the position of the *wh*-element, with varying degrees of success. They have also received tuition on the use of auxiliary verbs. However, their deficit in this domain has proven remarkably persistent. They have not, however, received specific tuition with respect to the use of the negative particle. Table 11 provides a summary of the subjects’ scores from the standardised tests. The SLI children had a mean non-verbal IQ of 108.3 (15.4 SD), within normal limits, as measured by the Block Design sub-test from the British Ability Scales (BD-BAS) (Elliot, Murray & Pearson, 1978). They had a mean equivalent age of 7:4 (1.0 SD) on the Grammatical Closure sub-test from the Illinois Test of Psycholinguistic Abilities (GC-ITPA) (Kirk, McCarthy & Kirk, 1968), which measures expressive morphology. On the Test of Reception Of Grammar (TROG) (Bishop, 1983), measuring understanding of sentences, their mean equivalent age was 7:8 (1.5 SD), and on the British Picture Vocabulary Scale (BPVS) (Dunn, Dunn, Whetton & Pintilie, 1982), a test of single word comprehension, they

²⁰ These were a subset of the original 14 subjects examined in Experiment 1.

performed at a mean equivalent age of 8:4 (2.0SD). These tests were then used to match the SLI subjects with a number of control groups.

Measure	SLI (N=10)	LA1 (N=12)	LA2 (N=12)	LA3 (N=12)	CA (N=10)
AGE					
Mean (SD)	15:3 (2.3)	6:0 (0:4)	7:0 (0:4)	8:1 (0:4)	15:5 (2:3)
Range	12:11-18:10	5:7-6:5	6:6-7:6	7:7-8:6	12:11-18:11
GC-ITPA					
Mean (SD)	22.2 (3.49)	22.58 (4.50)	27.0 (2.61)	28.08 (2.84)	n/a
AE	7:4 (0:10)	7:7 (1:4)	9:0 (1:0)	9:3 (0:11)	n/a
z-score	n/a	1.58 (1.16)	1.76 (0.56)	0.94 (0.83)	n/a
TROG					
Mean (SD)	14.5 (1.75)	14.67 (2.17)	15.83 (1.82)	17.50 (1.98)	n/a
AE	7:8 (1:7)	7:9 (1:9)	8:10 (1:7)	10:0 (1:6)	n/a
z-score	-1.65 (0.67)	0.64 (0.92)	0.54 (0.75)	0.98 (1:20)	n/a
BPVS					
Mean (SD)	76.9 (14.67)	61.08 (6.08)	76.33 (14.53)	84.67 (13.72)	124.9 (12.12)
Standard score	71.3 (8.49)	106.42 (6.6)	113.17 (14.24)	111.08 (14.65)	96.5 (2.77)
AE	8:4 (2:9)	6:7 (0:8)	8:4 (1:9)	9:2 (1:7)	15:6 (2:7)
z-score	-1.91 (0.57)	0.43 (0.44)	0.88 (0.95)	0.74 (0.98)	-0.23 (0.18)
BD-BAS (IQ)					
Mean (SD)	108.33 (15.40)	n/a	n/a	n/a	106.7 (6.2)

Table 11: Subject details: Chronological ages and raw scores on the standardised tests.

3.4.2.1.2 Language ability control groups

Three groups of 12 normally developing children provided language ability (LA) control groups. As these groups were identical to those examined in Experiment 1, I refer the reader to the discussion in section 3.1.2.1.2 for details.

3.4.2.1.3 Chronological age control group

Ten normally-developing subjects aged between 13:5 and 19:8 (mean 16:1) made up the chronological age (CA) control group. These subjects were matched to the SLI group for their age and non-verbal IQ (mean 106.7, 6.2 SD) as measured by the Block Design sub-test of the British Ability Scales (BD-BAS) (Elliot, Murray & Pearson, 1978). The CA control group were also assessed using a standardised language test (BPVS) in order to compare their normal performance with that of the SLI group. The CA group scored significantly higher than the SLI subjects: BPVS $t(18) = 7.14$, $p < .0001$.

3.4.2.2 Design

The task required the children to judge whether a range of negative constructions were grammatical. The constructions varied on their grammaticality, whether the negative element was contracted, and the force of the sentence (declarative or interrogative, with interrogative force further divided into subject and object questions, see table 12). I compared the effects of these variables in a 2(Grammaticality: Grammatical, Ungrammatical) x 2(Contraction: Contracted, Non-contracted) x 3(Force: Declarative, Subject Question, Object Question) by 2(Group: SLI, CA) or 4(Group: SLI, LA1, LA2, LA3) design. For each type of construction 6 examples were presented, giving a total of 72 experimental items compared by 2 or 4 groups, examples of which are given in table 12.

Sentence	Grammaticality	Contraction	Force
Jeff didn't pop the balloon	grammatical	contracted	declarative
Jeff didn't popped the balloon	ungrammatical	contracted	declarative
Jeff did not pop the balloon.	grammatical	non-contracted	declarative
Jeff didn't popped the balloon.	ungrammatical	non-contracted	declarative
What didn't pop the balloon?	grammatical	contracted	subq.
What didn't popped the balloon?	ungrammatical	contracted	subq.
What did not pop the balloon?	grammatical	non-contracted	subq.
What not pop the balloon?	ungrammatical	non-contracted	subq.
What didn't Jeff pop?	grammatical	contracted	objq.
What did Jeff didn't pop?	ungrammatical	contracted	objq.
What did Jeff not pop?	grammatical	non-contracted	objq.
What did not Jeff pop?	ungrammatical	non-contracted	objq.
The window did not kiss the desk		Semantic control	

Table 12: test stimuli

3.4.2.3 Procedure

The children were tested either at home or in a quiet room at school by an experimenter who was familiar to them. Three card models of Aliens were introduced as visitors from another planet. The children were told that the Aliens wanted to learn how to talk to earthlings and needed their help. They were instructed to listen carefully as the Aliens tried to talk and after each attempt to make a judgement as to whether the sentence was correct. If they thought the sentence was produced correctly the child was asked to give the Alien a star, if not, a spider. At the end the child would count the stars to see which Alien had won.

The examiner pretended to speak for the Aliens, limiting prosodic cues by maintaining a neutral stress. The 72 experimental items were supplemented by a further 6 'semantic control' items, grammatically correct items that were semantically odd (see table 12), and were preceded by 4 practice items, to which corrections were given. The instructions used at the beginning of each session are given in 33;

33. *These are three Aliens from another planet. They all want to learn how to talk to earthlings and want you to help them. They will take it in turns to say something. I want you to listen carefully and decide if they say it correctly. If you think it sounds right, then you give the Alien a star. If you think it sounds wrong, then you give the Alien a spider. The Alien who has the most stars at the end will be the winner! First we are going to have a practice, and I will help you.*

A test-scoring booklet was used for each child with the basic presentation format for each item in a set random order.

3.4.3 Results

The overall mean correct responses across the groups was 82.0% (3.49 SD, range 60.83 – 97.22%). The breakdown of responses for each group across each sub-condition are given in tables 13a and b.:

Condition	SLI (N=10)	LA1 (N=12)	LA2 (N=12)	LA3 (N=12)	CA (N=10)
Total correct (n=72)	43.8 (7.4)	59.3 (6.9)	60.9 (3.1)	61.2 (2.0)	70.0 (1.4)
Grammatical Correct (n=36)	23.8 (6.3)	30.3 (4.0)	28.6 (2.5)	29.6 (1.4)	35.0 (1.0)
Declarative (n=12)	10.6 (0.9)	11.5 (0.8)	8.9 (1.2)	9.2 (1.2)	11.7 (0.6)
Sub question (n=12)	6.3 (3.3)	9.5 (1.3)	9.5 (1.6)	10.0 (0.7)	11.7 (0.6)
Ob question (n=12)	6.9 (3.0)	9.3 (2.7)	10.2 (1.3)	10.4 (0.8)	11.6 (0.8)
Non-contracted (n=18)	11.1 (3.1)	14.5 (2.7)	14.2 (1.7)	14.4 (0.8)	17.6 (0.5)
Contracted (n=18)	12.7 (3.5)	15.8 (2.0)	14.5 (1.3)	15.2 (1.0)	17.4 (0.7)
Ungrammatical Correct (n=36)	20.0 (7.7)	29.0 (5.8)	32.3 (1.7)	31.6 (1.3)	35.0 (1.0)
Declarative (n=12)	6.1 (3.0)	8.7 (2.9)	10.5 (0.7)	10.5 (0.6)	11.8 (0.4)
Sub question (n=12)	8.3 (2.8)	10.9 (1.1)	10.6 (0.9)	9.8 (1.0)	11.4 (0.7)
Ob question (n=12)	5.6 (3.9)	9.4 (2.3)	11.2 (1.0)	11.3 (0.7)	11.8 (0.4)
Non-contracted (n=18)	10.1 (4.8)	13.0 (4.0)	16.6 (0.6)	15.6 (0.8)	17.5 (0.7)
Contracted (n=18)	9.9 (3.3)	16.0 (2.4)	15.6 (1.6)	16.0 (0.7)	17.5 (0.7)

Table 13a

Condition	SLI (N=10)	LA1 (N=12)	LA2 (N=12)	LA3 (N=12)	CA (N=10)
Total %correct	60.8	82.4	84.6	85.0	97.2
Grammatical % correct	66.1	84.3	79.5	82.2	97.2
Ungrammatical % correct	55.6	80.6	89.6	87.7	97.2

Table 13b

3.4.3.1 SLI/CA analysis

The group performances were investigated using a 2(Group: SLI, CA) x 2(Grammaticality: Grammatical, Ungrammatical) x 2(Contraction: Contracted, Non-contracted) x 3(Force: Declarative, Subject Question, Object Question) ANOVA by subject. A significant main effect of group was found, $F(1,18) = 110.01$, $p < .0001$. This reflected the fact that the CA controls had significantly more correct responses than the SLI subjects. A significant main effect of Force was also found $F(2,36) = 9.58$, $p < .0001$, which reflected significantly more correct responses to declarative sentences than to object questions. There was no significant main effect of either Grammaticality or Contraction (Grammaticality: $F(1,18) = .89$, $p = .359$; Contraction: $F(1,18) = 1.38$, $p = .256$). The Group x Force interaction was significant $F(2,36) = 8.72$, $p < .01$, indicating

that Force was differentially affecting the SLI subjects' and CA controls' performance. Further analysis revealed that the SLI subjects performed significantly better on judging both declarative sentences and subject questions than they did for object questions (declarative vs. object: $t(9) = 4.26$, $p < .01$; subject vs. object: $t(9) = 2.51$, $p < .05$), while CA controls showed no effect of Force. Similar differentiation was found with regards to the interaction of Group x Grammaticality x Force $F(2,36) = 6.27$, $p < .001$, and Group x Contraction x Force $F(2,36) = 4.94$, $p < .05$, where these were found to be significant factors in the performance of the SLI group, but not the CA group.

The interaction of Grammaticality and Force was found to be significant $F(2,36) = 4.90$, $p < .05$. Further investigation revealed that this was a reflection of an overall significantly better performance on grammatical declarative sentences in comparison to grammatical subject questions $t(19) = 2.76$, $p < .05$, grammatical object questions $t(19) = 2.79$, $p < .05$, and the ungrammatical declaratives $t(19) = 2.85$, $p < .05$. The interaction of Contraction and Force was also significant $F(2,36) = 4.76$, $p < .05$. This reflected a significantly better performance overall on non-contracted declaratives than on either non-contracted subject questions $t(19) = 3.58$, $p < .01$, or non-contracted object questions $t(19) = 3.07$, $p < .01$, as well as a significantly better performance on the contracted declaratives than on contracted object questions $t(19) = 2.33$, $p < .05$ and on contracted subject questions than on non-contracted subject questions $t(19) = 2.45$, $p < .05$.

Finally, the interaction of Group and Grammaticality was not significant $F(1,18) = .890$, $p = .359$.

3.4.3.2 SLI/LA analysis

These were investigated using a 4(Group: SLI, LA1, LA2, LA3) x 2(Grammaticality: Grammatical, Ungrammatical) x 2(Contraction: Contracted, Non-contracted) x 3(Force: Declarative, Subject Question, Object Question) ANOVA by subject. Significant main effects for Group, Contraction and Force were found (Group, $F(3,41) = 31.25$, $p < .0001$; Contraction, $F(1,41) = 36$, $p < .0001$; Force $F(2,82) = 20.68$, $p < .0001$), but the main effect for grammaticality was not significant $F(1,41) = .01$, $p = .936$.

To further investigate the main effect of Group, a planned comparison was carried out. The analysis revealed that the SLI children gave significantly fewer correct judgements than the LA control groups ($F(1,41) = 39.29, p < .0001$, SLI vs. LA1; $F(1,41) = 67.89, p < .0001$, SLI vs. LA2; $F(1,41) = 75.50, p < .0001$, SLI vs. LA3). The main effects of Contraction and Force were found to reflect a higher number of correct responses for contracted vs. non-contracted verbs and subject vs. object questions respectively.

The Group x Force interaction was found to be significant $F(6,82) = 3.67, p < .005$. Further analysis revealed that SLI subjects gave significantly fewer correct judgements for all Force types (declarative, Subject Questions, Object Questions) than the LA control groups (declarative sentences: $F(1,41) = 42.43, p < .0001$; subject questions: $F(1,41) = 62.01, p < .0001$; object questions: $F(1,41) = 73.74, p < .0001$). Additionally, it was found that the SLI group produced significantly more correct responses for the declarative sentences than for object questions ($t(9) = 5.43, p < .0001$), and both the SLI and LA1 groups produced significantly more correct judgements for the subject questions than for the object questions ($t(9) = 2.51, p < .05$, SLI; $t(11) = 2.50, p < .05$, LA1). Finally, it was found that while the SLI subjects produced significantly more correct responses for the declarative sentences than for subject questions ($t(9) = 2.56, p < .05$), the LA1 and 2 groups showed the opposite, a significantly better performance on subject questions than on declarative sentences ($t(11) = 4.63, p < .005$, LA1; $t(10) = 4.10, p < .005$, LA2). The LA3 group showed no effect of Force.

The interaction between Grammaticality and Force was significant $F(2,82) = 26.34, p < .0001$. It was found that significantly more correct responses were given for grammatical declarative sentences than for both grammatical subject questions ($t(11) = 5.08, p < .0001$) and grammatical object questions ($t(11) = 2.93, p < .05$). Significantly more correct responses were also given for ungrammatical subject questions than for grammatical subject questions ($t(11) = 3.23, p < .01$).

The interaction between Contraction and Force was significant $F(2,82) = 8.82, p < .0001$. It was found that more correct responses were given for both contracted and non-contracted declarative sentences, than for contracted and non-contracted subject questions (contracted declarative vs. contracted subject: $t(11) = 4.10, p < .01$; non-

contracted declarative vs. non-contracted subject: $t(11) = 5.74, p < .0001$) In addition, significantly more contracted subject and object questions were correctly produced than non-contracted subject and object questions (contracted vs. non-contracted subject: $t(11) = 2.60, p < .05$; contracted vs. non-contracted object: $t(11) = 3.08, p < .05$)

Finally, the interaction between Group and Grammaticality was not found to be significant $F(3,41) = 1.65, p = .192$.

3.4.4 Summary and interpretation of findings

Both the SLI/CA and the SLI/LA analyses showed a significant effect of group. The SLI subjects performed significantly worse overall than their CA and LA controls.

Force was found to have a significant effect in both analyses as well as the Force x Group interaction. Further investigation revealed that Force was a significant factor in the performance of the SLI group and the two youngest control groups, LA1 and LA2, but not in the performance of the two older groups, LA3 and CA. The main effect of Contraction was found to be significant in the SLI/LA analysis, but not in the SLI/CA analysis. Finally, the main effect of Grammaticality was not found to be significant in either analysis, and nor was the interaction of Grammaticality with Group.

The findings from this experiment indicate that SLI children have a general difficulty with the judgement of ungrammaticality in constructions where movement has failed to take place. In addition, the finding that Grammaticality was not a significant factor in their performance suggests that the children also had difficulty deciding whether the sentences which represented the appropriate movement applications were grammatical.

3.5 Experiment 5: The Scope of Negation

In this final experiment I will investigate negative scope. In particular, I will study SLI children's interpretation of scopal ambiguity and contrast these results with four control groups of ND subjects.

Scopal ambiguity can occur when a sentence involves more than one scope-bearing element. If we take the example in 34, we observe an ambiguity whose

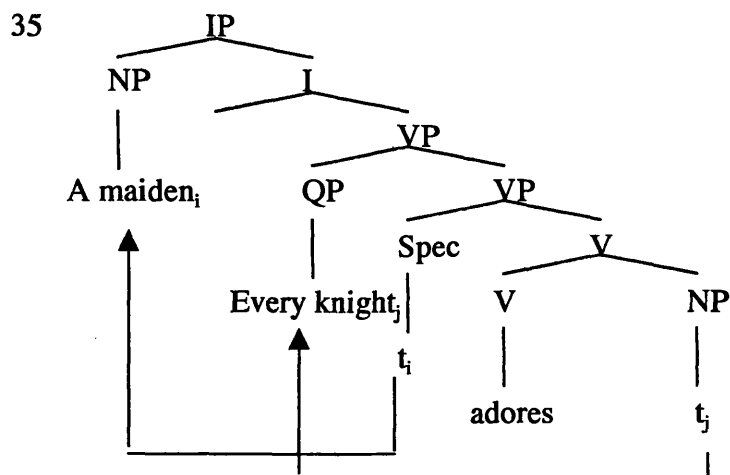
interpretation is dependent upon the scope of the two arguments *a maiden* and *every knight*.

34 A maiden adores every knight.

Under one interpretation, the scopal configuration corresponds to the S-Structure of the sentence, with the subject DP *a maiden* taking scope over the quantificational expression which it c-commands, *every knight* ($\exists > \forall$). For this reading there is a single maiden who adores all the knights.

The second interpretation involves the reverse configuration ($\forall > \exists$). Under this reading, there are as many adoring maidens as there are knights. This involves *every knight* taking wide scope over the subject DP *a maiden*.

Let's consider how a scope position is derived. If we take as a starting point the assumption that for one element to have scope over another, the first should c-command the second (cf. Haegeman, 1995) then we can readily account for the first interpretation of sentence 1. The second interpretation of the sentence, however, needs to be read off the LF representation. Consider the tree structure in 35.



The structure in 35 illustrates the standardly assumed LF representation of the second interpretation of sentence 34. At this level of representation, *every knight* occupies a scope position, which is VP adjoined. Following the assumptions outlined at the beginning of the chapter, the subject NP *a maiden* originates VP-internally, raising to the

subject position for Case reasons, leaving a trace (t_i) in the base position. Once the object, *every knight*, raises to the position where it is adjoined to the VP, it c-commands the VP-internal trace of the subject. Thus the ambiguity arises. While on the one hand the subject c-commands the object, on the other hand the object c-commands the trace of the subject.

This analysis, of course implies that scope relations can be determined on the basis of chains. That is, not only are the surface positions of the arguments relevant for the determination of scope but also the intermediary trace positions formed in the derivation of that position.

Scopal ambiguity may also occur in negative sentences when these contain a quantificational element. A negative particle also bears scope, which may interact with quantificational elements in much the same way as outlined above, creating multiply ambiguous interpretations. It is this type of ambiguity I examined here. The example in 36 represents the sort of sentence used.

36 All of the Simpsons are not skateboarding.

Again, the ambiguity of this sentence arises when we consider the interpretive configuration of the two scope-bearing elements. In the first interpretation with *All of the Simpsons* taking scope over the negative particle *not* ($\forall > \text{not}$) the entire set of individuals *Simpsons* hold the property of *not skateboarding*. In the second interpretation the reverse configuration again holds ($\text{not} > \forall$). Under this reading we do not require the complete set of individuals *Simpsons* to hold the property of *not skateboarding*, only a sub-set need hold the property for the sentence to be judged true.

If we consider the sentence's structure, represented in 37, it is not hard to understand how the ambiguity arises. The quantificational subject phrase originates VP-internally and subsequently raises to the matrix subject position, leaving a trace in its base position.

37 [_{IP} All of the Simpsons_i are [_{NegP} not [_{VP} t_i [_V skateboarding]]]]

As 37 illustrates, while the quantificational phrase c-commands the negative particle in the overt syntax, the negative particle is in a c-commanding position over the trace of the quantificational phrase.

Before beginning the discussion of experiment 5, let's consider the significance of scope and scopal ambiguity to our investigation in general. For our purposes, the main value of examining scope relates to the fact that many of its interpretations depend on the hearer's ability to access the underlying structural representations of the sentence. For instance, consider the second of the two scopal configurations discussed above. To arrive at this interpretation the child needs to be able to access the trace of the quantificational element, which rests in the base position below the negative particle. If the child is able to interpret the sentence in this way then this implies that the surface position of the quantificational element has been derived in the normal way.

3.5.1 Subjects

Five subject groups participated in the experiment: a group of SLI subjects, three control groups of younger children matched for a range of different language abilities and a group of older subjects matched for chronological age and non-verbal IQ. The SLI and LA control groups were identical to those examined in earlier experiments (1, 2, and 3). For details on these groups, I refer the reader to section 3.1.2. details of the CA group are given below.

3.5.1.1 Chronological age control group

Fourteen normally-developing subjects aged between 12:11 and 19:8 (mean 15.6) made up the chronological age (CA) control group²¹. These subjects were matched to the SLI group for their age and non-verbal IQ (mean 107.1, 6.2 SD) as measured by the Block Design sub-test of the British Ability Scales (BD-BAS) (Elliot, Murray & Pearson, 1978). The CA control group were also assessed using a standardised language test (BPVS) in order to compare their normal performance with that of the SLI group. The CA group scored significantly higher than the SLI subjects: BPVS $t(18) = 7.14$, $p < .0001$.

3.5.2 Experimental design

²¹ This group was comprised of the 10 subjects examined in Experiment 4, supplemented by another four subjects matched to the other four SLI children.

The data for Experiment 5 were collected using the same experimental design employed for experiments 1 and 2. To recapitulate, this involved three types of pictures each depicting three individuals. The pictures differed on the basis of a single property. In picture type 1 all of the individuals held this property, in picture type two only a subset (two) held this property and in picture type 3 none of the individuals held the property. The children were asked to study the picture and then listen to a recording of a sentence which described the picture. They were then asked to decide if the description was accurate. There were three types of sentence, repeated here as 38.

- 38 a. All of the Simpsons are not wearing hats.
 b. Not all of the Simpsons are wearing hats.
 c. None of the Simpsons are wearing hats.

Of the nine experimental conditions which this design produced, only one concerns us here. This is the condition where sentence type (a) was provided as a description of picture type 2. The other eight conditions were not considered to be ambiguous with respect to the judgement that was required of the child²² These results were analysed in experiment 2, as described above.

Now let us consider the ambiguous condition (henceforth AC) which arises when sentence (a) is presented with picture type 2. This second picture type depicts three individuals, a subset of whom hold a property. The ambiguity arises when we consider whether sentence (a) is an accurate description of this context. As discussed above, there are two interpretations of sentence type (a) which are dependent upon the configuration of its scope bearing arguments. If we take the first interpretation, where scope is read off the surface structure, then to be accurate it must describe a context in which none of the individuals hold the property in question. As such, under this interpretation sentence (a) fails to accurately describe the picture. However, if we take the second configuration, read off the LF interpretation (exemplified in 37), we would only require that a subset of the individuals hold the property and the sentence can accurately describe the picture.

²²The analysis revealed that the SLI children and their controls found a second experimental condition to be ambiguous. This was the condition with picture type 3 and sentence type 2. These were excluded from the analysis in experiment 2. I will discuss the findings for these condition later in this section.

Accordingly, I will assume that the judgement of the AC is directly dependent upon the scope configuration assumed by the child.

3.5.3 Procedure

As discussed above, the data analysed in this section was collected in the same experimental session as the data for experiments 1 and 2. Accordingly, I refer the reader to the discussion of experiment 1 for a full description of the procedure used in this experiment. However, before I proceed with the analysis of my results, it is necessary to point out some significant points regarding the data collection process. Firstly, given that the interpretation of structural ambiguity is potentially affected by intonation, the sentences were pre-recorded by an experimenter. This allowed me to minimise prosodic cues, while maintaining a normal speech pattern and, more importantly, ensured the consistency of the presentation to the subjects.

A second important factor relates to the findings from Experiment 2. Here I analysed the results from the interpretation of the non-ambiguous sentences. It was discovered that the SLI children's ability to correctly interpret these sentences was not significantly impaired. This is an important point because for the experimental conditions which we will analyse here, both responses are appropriate. If we found that the SLI children could not reliably interpret non-ambiguous conditions, then it would be useless to analyse ambiguous conditions since we would be unable to tell whether their response was a true reflection of a particular scopal configuration, or merely the child's inability to interpret the effect of the negative element.

3.5.4 Results

As with the non-ambiguous sentences analysed in Experiment 2, there were two possible responses that the child could give to each experimental item: Yes (the sentence accurately describes the picture) and No (the sentence does not accurately describe the picture). For the particular AC we are considering, a Yes response corresponds to the interpretation of the sentence where the negative particle has scope over the quantifier phrase, and a No response corresponds to the surface interpretation where the quantifier phrase takes scope over the negative element. The overall mean for yes and no responses

was: 2.53 (yes) 3.47(no). Table 14 gives the individual group means for the two possible responses.

	SLI n = 13	LA1 n=11	LA2 n = 11	LA3 n = 11
YES	2.85	2.64	2.18	2.45
NO	3.15	3.36	3.82	3.55

Table 14

As table 14 illustrates, all five groups were sensitive to the ambiguity of this condition. A statistical analysis of the variation between the groups was carried out and this revealed that there was no significant variation between the results for either the SLI vs. LA analysis $F(3,43) = .95$; $p = .424$ or the SLI vs. CA analysis $F(1,45) = .08$, $p = .779$. This finding suggests that the SLI children were freely able to access the 'structural' interpretation of the sentence, and surprisingly, that they chose this interpretation more frequently than any of the control groups, though their results matched most closely with those from the CA group.

I followed up this analysis by considering the results for the individual experimental items. Table 15 gives the results for each of the six ACs presented in the experiment.

		SLI	LA1	LA2	LA3	CA
AC 1	Yes	1.85	2.18	1.09	2.18	1.82
	No	4.15	3.82	4.91	3.82	4.18
AC 2	Yes	1.85	2.73	1.09	1.64	1.82
	No	4.15	3.27	4.91	4.36	4.18
AC 3	Yes	3.23	2.73	2.18	2.73	2.55
	No	2.77	3.27	3.82	3.27	3.45
AC 4	Yes	2.31	2.73	2.73	2.73	2.31
	No	3.69	3.27	3.27	3.27	3.69
AC 5	Yes	5.54	5.45	5.45	5.45	5.54
	No	0.46	0.55	0.55	0.55	0.46
AC 6	Yes	1.38	0.00	0.55	0.00	.18
	No	4.62	6.00	6.00	6.00	5.82

Table 15: Mean Yes and No responses

As can be seen from table 15, all of the experimental items show at least some variation. This finding pertains to the question of to what extent prosodic cues may have affected the children's interpretation of the items. The fact that there is at least some variation in the judgement on all of the items suggests that this effect could not have had a major influence on the children's performance.

3.5.5 Discussion

The SLI children performed in a manner that was consistent with both their LA and CA control groups. They appear to be able to access the 'structural' interpretation of the ambiguous sentences and their performance was closer to optionality than that of any of their controls. This finding clearly suggests that the SLI child is accessing the underlying structure of the sentence, as would be predicted given Generalisation 3.

The design of the experiment does not eliminate the possibility that prosodic cues may have a significant effect on the children's performance. While the method of pre-recording the presentation allows for consistency, this only ensures that cross-group comparisons are valid. It could still be the case that prosodic cues are the main guiding factor in the children's performance. To eliminate this possibility, I considered the proportion of Yes and No responses to each of the experimental conditions. The findings for this analysis revealed substantial variability across the vast majority of the experimental items and for each of the groups. This finding is not consistent with the conclusion that prosodic cues played a significant role in the children's responses. Rather, it suggests that the children were responding optionally.

This concludes the discussion of my experimental study. In the next chapter, I'll return to my theoretical proposals. I'll consider the implications of these findings and other developments in linguistic theory.

CHAPTER 4

In this Chapter, I will consider the experimental findings reported in Chapter 3 and their theoretical implications. To begin with, I will develop in more detail the analysis which I started to outline at the end of Chapter 2. I will consider the status of the account, as well as its components, within the syntactic theory which provides my framework. Then I will move on to discuss the implications of each experiment in turn, concluding that in most cases the predictions of my account are supported.

I will then move on to a discussion of some of the new developments in the Minimalist Framework, which are outlined in Chomsky 2000 and Chomsky 2001. I will briefly discuss the relevant points in Derivation by Phase and consider their implications for my account of SLI. In particular, I will consider the status of the Principle of Procrastinate in the light of these developments.

In the final sub-section of Chapter 4, I will summarise some of the shortcomings of my analysis as I see it and suggest possible alternatives or modifications which might better accommodate the theoretical implications of Derivation by Phase. I will also provide an analysis that is less dependent upon the components of any particular theory.

4.1 The Principle Conflict Account of SLI (PCA)

As discussed in Chapter 2 there are three Generalisations which provide the basis for my analysis of SLI children's language. These are repeated below, in 1;

1. **Generalisation 1:** SLI children's deficit relates to both their productive and receptive abilities.

Generalisation 2: SLI children's errors are uni-directional in their nature.

Generalisation 3: The SLI child's language displays true optionality.

I refer the reader to Chapter 2 for a detailed discussion of each of the three Generalisations and their motivation. These Generalisations relate to the characterisation of the disorder and have profound implications for the nature of the analysis that I propose as an explanation of this characterisation. Without a clear conception of the nature of the disorder it would be impossible to formulate an explanation of it and, equally, it is from this basis that the PCA begins.

As was discussed in Chapter 2, the PCA centres on the idea that the optionality referred to in Generalisation 3 can be explained by suggesting that the SLI child's grammar contains two principles which consistently conflict, each selecting a different optimal derivation from the set of available possibilities. As a result of this conflict, the SLI child is forced to choose one of the principles and reject the other, selecting the derivation accordingly. For this discussion let us call the process of arriving at this decision the 'principle choice'.

For these purposes, cost, in the Minimalist sense, is not a factor in the process of principle choice²³ and, as such, the selection is taken to be completely random. This allows us to successfully side-step the difficulties related to optionality inherent in any economy based framework such as the Minimalist Program, which ultimately requires that only one possible derivation from a given numeration should be optimal in terms of its 'cost'. In addition, principle choice is assumed to take place intra-sententially. That is, for every element that the two principles govern, the choice must be made afresh, rather than once in each derivation. This is a significant point, since it leads us to a position where a single derivation is usually not produced wholly in accordance with either of the two principles and, as such, is not the optimal derivation specified by either. The fact that principle choice is applied intra-sententially is important when we consider its empirical consequences. In the present case, the principle conflict relates to whether the movement operation takes place or not. If I proposed that the choice between the two principles were made only once in each new derivation, then we would never expect to find a situation where one movement operation has taken effect while another has been omitted. The fact that the effect of one movement process can clearly be observed in the absence of another implies that the effect of the two principles must both be present in the derivation of that sentence, if my proposals are correct.

Now let's consider the nature of the two principles which conflict in the SLI grammar: the principle of Procrastinate and the principle of Full Interpretation. First I'll examine the interaction of these two principles in the ND grammar and then discuss how the SLI child's grammar differs. The principle of Procrastinate marks the cost distinction

²³ Any more than the extra cost involved in selecting additional lexical items is taken into account when formulating the numeration (in the sense discussed in Chomsky 2000).

between overt (pre-spell-out) and covert (post-spell-out) movement. The basis for this distinction is that movement in a derivation prior to spell-out necessarily involves the displacement of an entire lexical item including its phonological content, while movement in the LF syntax need only involve the feature which is the focus of the checking operation.

Essentially, Procrastinate can be defined as follows: avoid movement so long as this does not cause the derivation to crash. In the derivation of a sentence Procrastinate will 'delay', until after spell-out, any movement operation that is not forced by the requirement to check a strong feature.

Full Interpretation (FI) is the principle that effectively forces movement operations to take place. It marks the requirement that all uninterpretable features must be eliminated from a derivation before it reaches the LF interface. As discussed in Chapter 1, checking is the process by which uninterpretable features are eliminated from the derivation. In order to check an uninterpretable feature, a checking configuration with a matching interpretable feature must be established²⁴. All obligatory movement operations necessarily form checking configurations (Last Resort) and, equally, if a movement operation fails to take place, the checking operation which it facilitates is also omitted causing the derivation to crash by FI.

Now let's consider the interaction of these two principles in the derivation of the sentence in 2:

1 Betty hugged Dorothy

The subject NP *Betty* raises from its base position internal to the verb phrase to the Spec of IP in order to check a strong D feature and satisfy the EPP. The strength of the feature is the crucial factor in deciding whether the subject moves. On minimalist assumptions a strong feature must be checked in the overt syntax otherwise the derivation will crash by FI. Procrastinate does not take effect because the delay of movement would preclude convergence. The morphology associated with the verb, however, is not strong (in English). As such, Procrastinate delays the movement process without preventing

²⁴Note, a checking configuration cannot be formed in a trivial chain i.e.- one that is not formed through movement of an element or feature.

convergence or violating FI. As a result, the PF representation of sentence 2 reflects the movement of the subject but not the verb. Consider 3 and the contrast in 4.

3. $[_{IP} \text{Betty}_i [_{TP} [_{VP} t_i [_{V'} \text{hugged} [_{NP} \text{Dorothy}]]]]]$

4. a. Betty often hugged Dorothy
b. *Betty hugged often Dorothy

After spell-out, Procrastinate can no longer delay movement since to do so would allow uninterpretable features to remain in the derivation at the LF interface, violating FI. The verb (or at least its formal features) raises to the TP as exemplified in 5.

5. $[_{IP} \text{Betty}_i [_{TP} \text{hugged}_j [_{VP} t_i [_{V'} t_j [_{NP} \text{Dorothy}]]]]]$

In the ND grammar, therefore, Procrastinate works to minimise the cost of movement by delaying it as much as possible until the covert syntax. FI crucially interacts with this role of Procrastinate by constraining its application and ultimately violating its delay function for the purposes of convergence.

Let's consider how this interaction might differ in the SLI child's grammar. As discussed, the language of SLI children appears to reflect an additional optionality which is not represented in normal development. Under the present account, this contrast is assumed to relate to the optional absence of normally obligatory movement operations. At this point a question arises: in what way might the SLI child's grammar differ from that of the ND child's so that it produces this contrast in their language? It is my proposal that the role of Procrastinate and its interaction with FI might provide a principled answer to this problem. First, consider the possibility that the nature of Procrastinate is subtly different in the SLI grammar. If we examine the make-up of Procrastinate, it appears to contain two components: the first is a delay function, which we could say instructs the grammar not to move, and the second is a proviso that this should be rejected if it causes the derivation to crash. It is this second component of Procrastinate which I suggest is the locus of SLI children's deficit. In effect, I take Procrastinate to be less sophisticated in SLI with the delay function but not the constraint that this should be rejected if it violates FI.

The reduced version of Procrastinate simply instructs the SLI grammar not to move. This instruction is, of course, ultimately at odds with FI, since by preventing movement it stops checking from taking place. If we tentatively accept this as true, then the SLI grammar would contain two principles which are in conflict, one forcing movement and the other prohibiting it. As described above, the child must choose which principle to follow and which to reject. This choice is completely optional and, once made, dictates the path the derivation must take.

Given these assumptions, we may ask what aspects of the SLI child's grammar we would expect to be affected. The account predicts that there will be two groups of vulnerable elements. The first consists of those elements whose interpretation/realisation is dependent upon the checking process facilitated by movement, and the second consists of those elements whose interpretation/realisation is dependant upon the movement process itself.

In the first group we find functional properties such as tense and agreement. Under the PCA verbal agreement should be subject to omission when the movement process which raises the verb to IP fails to occur. The reason for this is that agreement is not interpretable on the verb and therefore checking is required against the subject nominal in IP for its morphological realisation²⁵. Alternatively, agreement on nominals should be unaffected by the deficit, since it is interpretable and, as such, not dependant upon checking relations.

Tense is a slightly more complex issue. While it is interpretable on the verb, it carries an uninterpretable tense feature which still requires checking against the matching interpretable feature on T. As such, the specification of tense on the verb is also dependant upon the application of a movement process which is subject to omission under the PCA.

Case is another property which falls into this first group. While Case is not an interpretable feature of nominals, it is an intrinsic property of them. As such we would always predict that Case would be specified in one form or another. However, if the checking process does not take place, then the child's computational system would fail to ensure that the correct form of the nominal is used given its structural position. As it

happens, this does seem to be the case. However, there appears to be an additional property of the language which the account does not predict. I refer to the default strategy that the child appears to adopt. While this default strategy is not a prediction of the account, it would not constitute a problem for it either.

The second group of elements are those whose specification/interpretation is dependent upon the movement process itself. Elements in this group include structural relations, such as thematic roles and pronominal reference, and movement operations which effect overt changes in word order, such as *wh*-movement. The predictions of the PCA for these elements are slightly easier to formulate. In the case of the structural relations, their interpretation is dependent upon the child's ability to access the underlying structure of the sentence. Considerations such as dominance and *c*-command are important. If the child is unable to access the underlying structure of a passive form then they will fail to correctly interpret its thematic structure. Equally, if a movement operation does not take place then the displacement of the lexical item should not be reflected in their production.

To summarise, in this section I have provided an outline of the PCA. At its basis is the assertion that movement can provide an effective characterisation of the children's grammatical difficulties. In addition, a number of Generalisations have been proposed which relate to the nature of the errors that the children produce. The PCA itself is a proposal of how these factors can be collectively explained in a principled way. From here I will move on to examine some of the issues relating to the theoretical status of this account and its components. This will be the focus of the next section.

4.2 The theoretical status of the PCA

By adopting a particular theory of grammar in which to frame my analysis I necessarily commit myself to a number of additional assumptions about the architecture I utilise. While there is clearly an atheoretic core to my approach, namely that given a pair of principles α and β , which are in conflict, optionality will result provided that all else is equal, I employ the principles of a specific framework to give my analysis substance. In this section I will examine questions relating to my analysis as it stands within the

²⁵Issues relating to the lexicalist hypothesis will be considered in the next sub-section.

minimalist framework. Four issues will be addressed; my rejection of Chomsky's 'strict' lexicalist stance, the omission of auxiliary and copular verb forms, the idea that uninterpretable features may survive to the LF interface and my assumptions about the extent of PF's access to the products of post spell-out operations.

4.2.1 Rejection of the Lexicalist Hypothesis

The first issue I address is my rejection of the strict lexicalist stance which Chomsky (1993,1995) adopts. Under this view, the verbs which are taken from the lexicon are already fully inflected. While they must still associate syntactically with the appropriate functional heads, this is only in order for their inflectional properties to be checked against the abstract features of the functional heads, rather than acquired as affixes. Were I to adopt this assumption, I would be unable to explain the children's omission of inflectional morphology. A central assumption of the PCA is that the emergence of inflectional information on a lexical item is the result of the syntactic process of checking. Under a strict lexicalist view, the failure to check would not result in omission, but rather the use of inappropriate forms since there would be no constraint on the morphology which was inserted²⁶. A number of accounts of SLI reject this strong lexicalist stance, at least implicitly, (cf. Rice et al., 1995; van der Lely, 1998). This is not necessarily problematic since the major motivation for such a position is theory internal, a requirement of the minimalist architecture²⁷. But are there independent reasons for doubting it?

The major evidence which suggests that doubt could be cast on the strong lexicalist position relates to the observation that the morphological structure of a lexical item seems to reflect the hierarchy of functional items in the syntax, an observation made by Baker's (1995) Mirror Principle. If we hold that the inflectional affixes which express these functional properties are added lexically, then it would be unexpected to find such a recapitulation of the functional ordering in the syntax, at least there would be no reason to expect it. Chomsky (1993) discusses this observation and proposes a possible

²⁶Note that under the PCA there is no constraint on the insertion of morphology when movement fails; however, since such morphology does not surface, inappropriate forms are not predicted to be used.

²⁷However, equally any account framed within a minimalist perspective of language design would encounter difficulties related to the rejection of this hypothesis. I'll return to this point in section 4.6

explanation, which is consistent with the Minimalist stance. This proposal is considered by Halle and Marantz (1993) who suggest that there may be a number of problems with it. However, they also point to evidence that Baker's principle may encounter difficulties when we consider additional processes like head merger.

For the purposes of this discussion I'll make the assumption that there are reasons to doubt the strong lexicalist stance and leave the issue there. I will propose the principle in 6, for the time being.

6. For the functional property expressed by a non-intrinsic feature F to be realised it must be checked against a matching feature.

Consider two points relating to 6. First, it states that only non-intrinsic features need to enter a checking relation in order to be realised. As noted above, Case does not fall into this category. However, Case is realised in the sense that it is always represented in the children's speech, but not always correctly. Secondly, it should be noted that 6 is not a complete rejection of Chomsky's lexicalist stance. It does not preclude the possibility that the functional properties of the lexical item (LI) are added lexically. Rather, it states that these properties can only be *activated* if they undergo checking.

4.2.2 The omission of auxiliary and copular verbs

Another issue arising from the PCA relates to the children's omission of auxiliary and copular verbs (see the discussion of Experiment 1). In this case, an entire lexical item is assumed to be omitted as the result of the child's failure to move/check. The question that arises is whether or not it is principled to assume that an entire lexical item can be subject to omission in this way. If we consider a parallel with main verbs, they are clearly not subject to omission in their entirety. Only the optional affixes of the verb, which encode the functional information, are omitted.

One possibility which has been considered is that the irregularity of auxiliary and copular verbs plays some role. If there is no separate affix then it could be suggested that the whole form may be subject to omission. Wexler in the latest formulations of his (E)OI account takes a similar view, adopting various proposals from Halle and Marantz's concept of Distributed Morphology. Although he doesn't specifically apply this reasoning

to an analysis of auxiliary verbs, under this view, if a form is only partially specified then it is precluded from emerging. As such, given that copular and auxiliary verbs form an indivisible whole with their functional information, they will be entirely omitted when this information is inert. An immediate problem arises, however, when we consider the children's use of irregular main verbs. Evidence suggests that main verbs are not subject to omission, irrespective of their regularity. This would not be predicted by such an account. If the relevant distinction was regularity then the verb should be subject to omission irrespective of other factors.

An alternative suggestion is that auxiliary and copular verb forms are themselves devoid of any interpretive content and act merely as the vessels which carry the functional properties of main verbs. This view is advocated in works such as Chomsky, 1993 where auxiliary and copular forms are considered to be similar to inflectional morphology, but without the requirement for affixation.

In Chapter 3 we considered a Minimalist analysis of negation which crucially made this assumption. This analysis proposed that the overt raising of these verbal elements in English was a direct result of their lack of interpretive content. Specifically, it was suggested that auxiliary and copular verbs raised overtly because they were not visible to the LF component of the grammar. However, would it be correct to suggest that verbs such as *be* and *have* are semantically vacuous? A reason to doubt this assumption, for example, is that we can often find cases where auxiliary and copular verbs apparently have an interpretation which corresponds to a main verb. For example, *be* in 7a has a meaning similar to that of *exists* in 7b.

- 7 a. There is a solution
- b. There exists a solution

It would not be reasonable to suggest that a verb such as *exists* has no semantic content. However, is *be* truly synonymous with *exist*? I feel sure that they share some important interpretative properties, but *exists*, at least in some contexts, seems to express more than *be*. To illustrate, consider the contrast in 8;

- 8 a *A solution is
- b A solution exists

Here we can see that *be* and *exist* have slightly different distributions. This contrast, while essentially syntactic, demonstrates that the distribution of *be* is more constrained than that of *exist*. Now consider example 9;

- 9 a A solution is in existence
 b !A solution exists in existence

In 9, the difference in meaning expressed by the two verbs *be* and *exists* is apparent. While (a) is fine, (b), in contrast, is a little odd. I would argue that this difference relates to the meaning of *existence* in 9. To say that something is *in existence* entails that it *exists*, the fact that 9 (b) is strange relates to the fact that both *exists* and *existence* attribute the same property to *a solution*. Equally, the fact that 9 (a) is fine suggests that *is* does not attribute this property. Note that, while 9 (b) is not ungrammatical, the meaning of *existence* seems to change. *Existence* seems less abstract and more akin to the meaning of reality in 10.

- 10 A solution exists in reality

While it is clear that there is some shared property between these two verbs, accounting for the ungrammaticality of 11, I would argue that *be* in most contexts expresses only the functional properties associated with *exists* and that in 7 (a) *existence* is only implied.

- 11 *There is exist a solution.

In other words, the implication associated with *be* in 7 (a) is a product of its context and not intrinsically associated with the verb itself. This point is supported by the fact that it appears to be cancellable, consider 12;

- 12 I know that there is a solution but it doesn't exist yet.

While I feel that there is good evidence that auxiliary and copular forms are semantically empty apart from the functional properties they encode, the argument is less clear for the modal auxiliaries such as *will*, *can*, *may* and *must*. I would be surprised if similar arguments could be framed for them. However, this is an empirical question that

still needs to be addressed. The most likely prediction from the PCA would be that the SLI child would not show the same difficulty with modal auxiliaries, i.e. that they would not omit the verb form, but would produce inappropriate forms of the type observed in the production of irregular main verbs (van der Lely & Ullman, 1997).

4.2.3 Uninterpretable features at LF

If we adopt the PCA as a theory of the SLI child's grammar, then at times, depending on the outcome of principle choice, an uninterpretable feature will survive to the point where a derivation reaches the LF interface. The question that arises is, why this does not cause the derivation to crash, especially when the interpretability of that feature is determined on the basis of considerations internal to that interface.

Although the PCA provides a relatively straightforward answer to this question, this requires a number of implicit assumptions that need to be examined. The explanation which arises from the PCA can be formulated as follows: given that the principle of full interpretation is assumed to embody the requirement that an uninterpretable feature needs to be eliminated prior to the LF interface, under the PCA when FI is rejected, this requirement no longer applies in that particular instance. That is, it no longer applies with respect to that feature. This is, I feel, a relatively neat analysis arising naturally from the assumptions of the PCA. However, its plausibility rests upon a relatively tricky assumption, namely that Full Interpretation and the concept which it embodies should be thought of as being separate from the core qualities of the LF interface. Should FI be seen as a principle which bears upon the interface level itself, or is it merely a formal description of one of the characteristics of this level? If we conclude that it is, then can it be rejected in the way described by the PCA?

To answer these questions we need to consider the exact nature of FI. It is important to distinguish between two properties of the grammar; first, that interface levels can only perceive elements which are specifically interpretable to them, and second, that all non-interpretable features must be eliminated by the time the derivation reaches the interface level. While these two are clearly related they certainly do not imply one another. The first is most probably a property of the interface. Given Chomsky's view of the architecture of the language faculty and its relations with other quasi-modules, this is

the predictable result of any interaction between two different domains of the mind. The second, however, is most likely not a core property of the interface. The requirement that non-interpretable elements are eliminated in the syntax seems to be related to general economy considerations. While the process of their checking certainly serves a syntactic purpose, the motivation for this checking is to eliminate all non-essential material prior to the interpretive level of sentences processing. In other words, there is a requirement to eliminate as much unnecessary information as possible prior to LF.

While this checking requirement and the uninterpretability of features at the interface are clearly connected, interpretability being the criterion upon which the necessity of a feature is determined, the reason why these features are eliminated is presumably to reduce processing requirements at LF. As such, it would be unlikely for this requirement to be part of LF per se. Rather, it appears to be an economy constraint which bears on the interface and which FI embodies in the grammar.

The autonomy of FI lends plausibility to the suggestion that it may be selectively impaired, a point which is crucial for my formulation of the PCA.

4.2.4 The effect of post spell-out operations on PF

As I see it, the main theoretical motivation for Chomsky's strict lexicalist stance relates to the 'double cycle' structure of the computation which the Minimalist Program assumes. I use the term double cycle to distinguish between pre and post spell-out syntax. As discussed, spell-out is the point at which the derivation of a sentence splits off towards the different levels of competence PF and LF. Operations which take place in pre spell-out syntax have an effect on both interface levels while it is standardly assumed that operations in post spell-out syntax may only have an affect on a single interface. If we take these assumptions into account we can begin to see why the lexicalist stance might seem attractive. Consider the case of overt morphology. If we maintain that this is the product of transformational operations, or in minimalist terms checking, then it becomes difficult to explain how the effect of these operations can be reflected in both the PF and LF output. In other words, if we hold that the affixation of an inflectional ending on a verb is dependant upon a post spell-out checking operation in the LF syntax, how does this come to be reflected in the PF representation of that sentence?

The lexicalist stance formulated in Chomsky, 1993 sidesteps this problem. Inflectional morphology, for example, is not the product of a syntactic operation, but is a property of the lexical item as it is selected from the lexicon. As such, it will emerge at PF with or without feature checking in the LF syntax. As discussed above, however, I propose to reject this strict lexicalist stance. How then, am I to overcome this difficulty?

One possible solution would be to suggest that the checking of these features takes place in the PF syntax. While this sounds a little strange, there are no a priori reasons why it might not be the case. Spell-out is the point at which features are stripped off on the basis of their relevance to each interface. Since an uninterpretable feature is, by its very nature, not relevant to the interface, there is no reason why the process of checking and eliminating these features might not take place in the PF syntax. However, let's consider this in the context of the SLI grammar. It is clear that, not only do the children have problems with the production of these elements, they also have difficulty comprehending the properties which they encode. Suggesting that the problem relates only to the PF syntax would bring us no closer to answering the question of why these properties are omitted in SLI children's comprehension.

Alternatively, it could be suggested that the operations which eliminate these elements take place in both the PF and LF syntax. This would allow us to capture the generalisation that the deficit affects both comprehension and production. However, this would involve a large amount of duplication in the theory of grammar; an unattractive feature in any economy based approach. Under this view a feature would need to be checked twice if it is not checked prior to spell out when the syntax is unified.

Another possibility is that, while the derivation of LF and PF divides at spell-out, the representations may still interact after this point, with the effect that the syntactic processes which occur subsequently remain accessible to both derivations. This option seems the most attractive at this point. It allows for the effect of the deficit on both comprehension and production while avoiding any necessity for the superfluous duplication of movement or checking processes in the derivation. For the time being I will accept this analysis as a working hypothesis, noting that this proposal encounters a potentially serious difficulty. This relates to the validity of the concept of strong features and, indeed, the dual mechanism approach itself. Specifically, if we assume the above

analysis no feature should be required to check in the overt syntax. This is because there would be no point in the derivation after which either interface becomes inaccessible. To suggest that a feature needs to check prior to spell-out would be a pure stipulation, as would the suggestion that there need ever be a point at which the derivation of the two representations is combined.

There is a final alternative, which is to reject the dual cycle approach. If we were to propose that there were only one cycle of movement then there would be no accessing problems. I'll return to this possibility in section 4.4, after considering the PCA proposal in light of the findings reported in Chapter 3.

4.3 The Findings from Chapter 3

In this section I will consider the findings from each of the five experimental studies discussed in Chapter 3, beginning with Experiment 1.

4.3.1 The production of simple negative sentences

First let's consider the predictions of the PCA for the production of simple negatives. The negative sentences examined in Experiment 1 were mainly of the form exemplified in 13.

13. The Simpsons are not on the skateboards.

{{Check examples}}

As discussed, the PCA broadly characterises SLI children's deficit on the basis of the movement/feature checking process. Taking this into account, in sentence 13 the PCA would predict that the main focus of SLI children's difficulties would relate to the correct specification of the auxiliary verb form. This is because the necessity of auxiliaries in negative sentences is dependent upon the requirement for the verb's features to move/check

The PCA would not predict any difficulty with the correct specification of the negative particle in either its full or reduced form. However, it is the presence of the negative phrase in the structure which necessitates the overt verb raising which the auxiliary undergoes.

While the subject nominal is also standardly assumed to undergo overt raising from a position internal to the VP, this is not predicted to be problematic under the PCA,

since the emergence of the subject is not assumed to be the product of feature checking²⁸. Therefore, while we would predict the ungrammaticality exemplified in 14a, we would not predict the ungrammaticality exemplified in either 14b or 14c.

- 14 a. *The Simpsons not on the skateboards
 b. *The Simpsons are on the skateboards (when a negative was targeted)
 c. *Are on the skateboards

In addition to the movement characterisation, as discussed, the PCA is based upon three generalisations. Two of these, Generalisations 1 and 3, do not bear directly on the nature of the SLI child's production, rather they specify that the deficit relates to both comprehension and production (Generalisation 1) and that both the grammatical and ungrammatical forms found in SLI children's language are represented in their grammar (Generalisation 3). These properties are important with respect to how the deficit should be formulated, but make no further predictions with respect to this experiment. Generalisation 2, however, which states that errors should take the form of omissions not commissions, does have a bearing on the account's predictions. The PCA has been formulated in accordance with this generalisation and, as such, the restrictions which bear on the application of movement in ND are left in place. As a result, we can make an additional range of predictions for the production of simple negative sentences. The PCA would predict that, while we would expect to find the form in 14a (repeated as 15a), we would not expect the form in 15b.

- 15 a. *The Simpsons not on the skateboards
 b. *The Simpsons is not on the skateboards

In example 15b the incorrect form of the auxiliary has been inserted. Given the assumption that a strict lexicalist stance is incorrect, the specification of the auxiliary

²⁸However, the overt position of the subject *is* the product of movement and feature checking (at least standardly, see the account from Manzini and Roussou, 1998 who assume that the subject is base derived in its surface position). While the children don't generally produce utterances of the form *not the Simpsons are on the skateboards*, this would be an unlikely form of production for subjects of this age at any rate. I would suggest that the children are able to apply compensatory strategies at an early age to avoid such mistakes. The children's speech and language therapy has dealt with these issues from a very early stage, and evidence from their interpretation of passives shows that they often associate the elements in the subject position with this thematic role irrespective of the underlying representation of such sentences.

form should be the result of a movement/ feature checking operation. If this operation does not take place then we would not expect the form to surface.

Now let's consider these predictions in light of findings from Experiment 1. The analysis revealed that there were no errors relating to the negative particle; when a negative was targeted, it was realised. However, there were a significant number of errors made by the SLI group and this reflected an inconsistency in their use of auxiliary and copular verb forms, as was predicted.

The initial analysis of variance revealed that none of the main effects other than group had a bearing on the children's performance. This finding is consistent with the PCA, indicating that the children performed equally well irrespective of whether a sentence was negative or affirmative, or whether the negative particle was full or reduced²⁹.

A further analysis, which focused on error types, revealed that the nature of the errors varied on the basis of whether the sentence was affirmative or negative. At first glance this finding was unexpected, given the account's prediction that this effect should not have a bearing on the children's production. A further unexpected finding was that the errors produced in the negative sentences were both omissions and commissions of the auxiliary verb. While this appears to contradict the account's predictions and more specifically the predictions of Generalisation 2, as discussed in Chapter 2, there are certain circumstances where commissions do occur which need not be considered problematic for the Generalisation. These commissions usually relate to elements which are intrinsic to the host lexical item (lexically specified) and mean that the usual strategy of omission is not a viable option.

As discussed in Chapter 3, this also appears to be a case where a principled exception to Generalisation 2 is found. It was noted that the analysis revealed that this pattern of over-production was extremely restricted. For example, the children rarely produced errors of commission in affirmative sentences. This contrast points to the conclusion that it is some aspect of the negative form that causes the commissions. This was supported by further analysis which revealed that commissions only occurred with

²⁹Note however, that both of these findings are somewhat unexpected from a processing account viewpoint where the specification of these elements arguably has an effect on complexity.

the reduced form of the negative particle. As I noted at the beginning of Chapter 3, there are a number of independent reasons to assume that the reduced form of the negative particle is attached to its host auxiliary through a lexical process (see Williams, 1995 for example). If this were the case, then we could explain the commission by suggesting that it is the requirement that the negative form be specified which causes the apparent commission, with the auxiliary being devoid of any informational content. Indeed, this finding is exactly what we would predict given our assumption that the reduced form of the negative particle forms a single lexical word with its host verb.

Now let's consider how this analysis holds for the conjoined sentences. These were more complex than the simple negatives discussed above. They usually consisted of a simple matrix clause which was conjoined to another simple form with an elliptical object, as exemplified in 16;

16 Those two are skipping and he isn't

The children's performance on these sentences was found to be significantly worse than for the simple sentences. However, this was most probably due to the fact that there were twice as many auxiliary forms to specify. The striking finding was that the majority of the children's errors were commissions of inappropriate forms, contrasting with the findings for simple sentences. In addition, these errors were mostly observed in the affirmative part of the sentence. These findings were extremely interesting, not to mention somewhat confusing. However, as with the analysis of simple sentences, there did appear to be some restrictions on the children's commissions. Error analysis revealed that while the commissions were not restricted to the negative contexts, they only occurred in the affirmative context when the reduced form of the negative was used in the other part of the sentence. The analysis which I proposed in Chapter 3 was that once an auxiliary form was used in a sentence this could be used in all of the positions where it was required. While this was only a tentative conclusion, the restrictiveness of the commissions suggests that an analysis along these lines is available and will become clearer with further experimentation.

To summarise, the findings from Experiment 1 were largely consistent with the predictions of the PCA. While the negative form was consistently produced, when

targeted, the children showed the expected deficit with the specification of the auxiliary/copular form. The analysis of the children's errors revealed that they almost always took the form of omissions, with the exception of certain restrictive domains. The fact that these apparent counter-examples to Generalisation 2 are so restrictive actually works in the Generalisation's favour. If we can explain why these exceptions exist, it lends credence to the assumption that the Generalisation holds in the unmarked cases.

4.3.2 Comprehension of negation

The experimental design utilised in Experiment 1 also allowed me to examine the children's ability to comprehend negative sentences; the focus of Experiment 2. The experimental conditions I examined required the children to judge whether or not a sentence accurately described a particular context. In order to make this judgement the children needed to be aware that the sentence expressed a negative proposition, and how the negative interacted with the universal quantifier *all*.

While the PCA would not predict any difficulties with the interpretation of the experimental conditions examined here, certain processing accounts, for example Leonard's surface hypothesis, most probably would. While Leonard does not specifically discuss negation, given his proposal that as processing complexity increases elements of low phonetic saliency should begin to be omitted from the child's interpretation, we should predict that negative elements would be vulnerable to these perceptual constraints. As such, the investigation of this domain should provide a valuable testing ground for both Leonard's and my own account.



For the PCA's part, as with the production of negative sentences, the account would predict that the interpretation of negation is non-problematic. In accordance with Generalisation 1, the SLI child's productive abilities should be mirrored in their comprehension.

Now let's consider the actual findings from Experiment 2. A number of main effects were examined. Of these, only the effects of Group and Verb type achieved significance. The significant effect of Group reflected a deficiency in the performance of the LA1 group, which was significantly below that of any of the other three groups (LA2, LA3, or SLI). The SLI group's performance was, however, comparable to the older LA


controls. The significant effect of Verb type reflected a within-subjects factor, and when the interaction of Verb type and group was considered, this did not achieve significance. This was also the case with the other interactions, i.e. there were no significant between-subject factors. This finding corresponds exactly with the predictions of the PCA; the SLI children's performance was consistent with that of their language-matched peers, suggesting that the children's unaffected production of negation was mirrored in its comprehension. Contrary to the predictions of the surface account, it appears that the increase in processing which a negative sentence entails had no effect on the children's ability to perceive negative elements.

4.3.3 The production of negative questions.

Let's consider the PCA's predictions. Two movement operations are of particular relevance to the present study. The first is the operation by which the *wh*-element is raised from its base position to the spec of CP. This movement is represented in 17a and b for subject and object questions respectively.

- 17 a. [_{CP} Who_i [_{IP} t_i [_{VP} [_V eats Aubergines?]]]]

- b. [_{CP} What_i [_{IP} Betty [_I did [_{VP} eat [_{NP} t_i ?]]]]]


The second important movement operation raises the auxiliary verb to the head of CP. This operation only takes place in object questions and is exemplified in 18.

- 18 [_{CP} What_i [_C did_i [_{IP} Betty [_I t_i [_{VP} eat ?]]]]]


According to the PCA, both of these movement operations should be subject to omission. As a result, we would expect to find instances where the *wh*-element surfaces in situ, and there are problems with the appropriate specification of the auxiliary form.

If we consider the findings from Experiment 3, as expected, the SLI children produced significantly more ungrammatical questions than their controls. The errors

came in a number of forms of which four general types were identified. I'll consider each of these types in turn.

Type 1 errors, which occurred only in object questions, related to the process of auxiliary raising mentioned above. Two forms of this type of error were identified. In the first, exemplified in 19, the auxiliary appears to have remained in situ. This finding is somewhat strange given that most investigations into the use of auxiliary verbs suggest that they rarely occur in inappropriate positions. Rather, it seems that when the auxiliary verb is problematic, it is omitted (cf. Rice et al., 1995).

19 *What the stork isn't doing?

This form of error appeared only with the reduced negative particle. As discussed in Chapter 3, this is consistent with the predictions of the PCA given my lexical analysis of the reduced negative form. Under this view, although the SLI child has failed to raise the auxiliary verb, it has not been omitted as we might expect because it forms part of a single lexical word with its attached negative, which still requires specification. When the negative is contracted a dummy form of the verb is inserted if the correct one is not specified. This analysis holds that the auxiliary verb has effectively been omitted and contains no informational content. It is a dummy element which has the sole role of supporting the reduced negative particle.

The second form of type 1 error, exemplified in 20, involves the apparent commission of the auxiliary. While the verb is specified in the appropriate derived position, it also surfaces in the lower position which is assumed to be the site of extraction.

20 *What does the stork doesn't have?

While the apparent commission error these examples represent would appear to contradict Generalisation 2, given that the auxiliary verb attached to the negative particle is assumed to have no informational content, the insertion of a second auxiliary does not constitute a commission error, at least not in the sense that is prohibited by the Generalisation. This analysis is supported by the fact that we do not find examples of double auxiliary structures with full forms of the negative particle. An alternative analysis

would be to suppose that the auxiliary verb may surface in any position for these children, but this analysis does not appear to be supported by the data. First, it would be unable to explain the distinction between the contracted and non contracted forms of the negative particle and, second, it would incorrectly predict forms such as 21a and b to occur, in which the verb surfaces internal to the VP

- 21 a. *What not the clown is wearing?
 b. *What the clown not is wearing?

If auxiliary verbs truly could surface in inappropriate positions, we would expect these forms to be attested, however they are not³⁰.

To summarise the main points, consider the following paradigm:

Figure 9: Type 1 error paradigm.

Forms		Attested
1	What isn't the clown wearing?	Y
2	What is the clown not wearing?	Y
3	*What the clown isn't wearing?	Y
4	*What the clown is not wearing?	N
5	*What is the clown isn't wearing?	Y
6	*What is the clown is not wearing?	N
7	*What the clown not is wearing?	N
8	*What the clown isn't is wearing?	N

The second type of errors related to the inaccurate specification of the auxiliary verb. Of these errors, two forms were observed. The first involved the omission of the auxiliary form and the second involved the apparent commission of an inappropriate form of the verb, exemplified in 22a and b respectively.

- 22 a. *What the clown not have?
 b. *What haven't he got?

³⁰This analysis may seem problematic. It certainly raises questions. However, to clarify my position, consider the numeration that may give rise to a sentence like **what did John didn't do?* This would normally be ruled out because *didn't* and *did* would have the same features to check. However, in the case of the SLI child *didn't* does not need to check any of the features normally associated with *did* and as such, this numeration can produce an admissible sentence.

As with the simple negative sentences examined in Experiment 1, the distribution of commissions of the auxiliary verb was extremely restrictive: once again commissions only occurred when the reduced form of the negative was used. As such, the findings for this type of error were consistent with the predictions of the PCA, and mirrored those in Experiment 1.

The third type of error related to the *wh*-element. As was predicted by the PCA, the movement of the *wh*-element was problematic. While the SLI children always produced a sentence initial *wh*-element, I concluded, as in previous studies, that in many cases this did not reflect the appropriate derivation of the element. In these cases an additional *wh*-element surfaced lower in the structure in the position of extraction, as exemplified in 23 a, for subject questions, and 23 b, for object questions.

- 23 a *What hasn't he got something?
 b *What is he not doing something?

This corresponds with the findings from previous studies which have investigated SLI children's production of interrogatives. The sentence initial *wh*-element appears to have been inserted by the child as the product of some explicitly learned strategy, while the lower *wh*-element reflects its true position. As such, this is exactly the sort of error which the PCA would lead us to predict. The *wh*-element is not omitted because it still possesses informational content; however, the movement operation which raises it to the sentence initial position is omitted because the process has been prohibited by the strengthened principle of procrastinate.

The fourth type of error produced by the SLI children was when an affirmative was produced, rather than the expected negative. Two forms of type 4 error were identified, these are exemplified in 24 a and b

- 24 a Probe: The Knight doesn't have something. Ask me what?
 Response: What does the Knight have? (SLI 7)

- b Probe: The stork hasn't got something. Ask me what?
 Response: What is missing from the pelican? (SLI 13)

Example 24a is what I referred to as an inappropriate negative. These appear to be cases where the negative particle has been omitted. As discussed, this form of error is not consistent with the predictions of the PCA. The requirement for the negative is assumed to be preserved in SLI production, and this assumption is essential to the analysis of the commission errors in simple negatives (Experiment 1). However, the analysis of this error type reveals that this form of error only accounts for a very small number of errors (7) and that this figure is not inconsistent with the production of the LA controls. As such, I concluded that this need not be problematic for my analysis in this case. The second form of type 4 error is the appropriate affirmative (24b). These are cases where the SLI child has been able to construct an affirmative question which is appropriate for the context. While the PCA's predictions do not bear on this form of production, the obvious processing capacity required in the construction of such an alternative is perhaps problematic for a processing account of the disorder. Also it was noted that appropriate affirmatives were not found in the controls' data.

In summary, the results from Experiment 3 appear to support the predictions of the PCA. Both the movement of the *wh*-element and the auxiliary verb were found to be problematic for the SLI child. In the case of *wh*-movement, the element was found to optionally surface in situ when the movement operation failed to take place. The auxiliary verb was optionally omitted in the cases where the full form of the negative particle was used. When the reduced form of the negative was attached, it appeared in situ. As discussed, following the lexical approach to negative reduction, the emergence of the negative auxiliary in an inappropriate position is admissible because the verbal element has no interpretative content. In this case it only represents the negative element. This analysis is further supported by the finding that the children sometimes 'double' their auxiliaries.

4.3.4 Grammaticality judgement

In this section I'll consider the findings from Experiment 4. This experiment considers the children's grammaticality judgements on a range of negative constructions. In this domain the PCA's predictions can be clearly distinguished from other accounts of the disorder, and this will be the focus of my discussion.

Consider the PCA's predictions for this domain. Firstly, we would expect the ungrammatical (omission) forms to be optionally judged as grammatical, since depending upon the outcome of the principle conflict the ungrammatical form may or may not be optimal. Secondly, this optionality would also be expected in the judgement of the grammatical forms because in the cases where the omission form is optimal, that is, when FI is rejected in favour of Procrastinate, the grammatical form is rejected as non-optimal, since it contains superfluous movement.

In both these predictions the PCA differs from many current accounts of the disorder, which see the SLI child's grammar as specifying a broader range of available options (cf. Van der Lely, 1998). The PCA would predict that, rather than coexisting, the different forms will optionally supplant each other as optimal. As such, in the SLI child's grammar, only one form is grammatical at any one time.

Now, let's consider the findings from Experiment 4. The overall mean for the CA group was found to be close to ceiling (97.2%), while the SLI group performed at just over 60% (60.8%). This finding would be consistent with most accounts of the disorder. For example, the accounts which assume a more inclusive grammar would expect correct judgements from the SLI child on all the grammatical sentences, but incorrect judgements on all the ungrammatical sentences, which would account for the finding that around 50% were correct. In addition, the finding that the main effect of group was a significant factor across both the SLI/CA and SLI/LA analyses is also consistent with most accounts since they would all assume that the SLI children would have difficulties distinguishing the grammatical sentences.

However, the finding that there was no significant effect of Grammaticality in any of the analyses would not be predicted by the broader grammar proposals. Moreover, the finding that the Group x Grammaticality interaction was not significant would constitute a direct contradiction of their predictions. Under this form of account we would certainly expect Group x Grammaticality to be a significant interaction, since it would predict that the grammaticality of a sentence would directly affect the SLI group's performance. The explanation for these findings can be found through further examination of the group means. There are two findings, which conflict with the predictions of these broader grammar proposals. Firstly, with respect to SLI children's acceptance of the

ungrammatical forms, the prediction that they will always judge these to be grammatical is not upheld. While an optionality in the acceptance of the ungrammatical forms is observed, this is far from 100%. Rather, the SLI children's acceptance of these forms seems to mirror the optionality of their production. It is possible that the less than 100% acceptance of these forms could be due to the SLI children's use of non-linguistic compensatory strategies. This would mean that while the SLI grammar accepts these forms, an alternative strategy intervenes and gives the correct judgement. Given the unaffected status of SLI children's non-linguistic abilities this is a possibility, however, it would not explain why the child only optionally applies these strategies.

A second finding with respect to the grammatical forms, is also clearly in conflict with the broader grammar proposals' predictions. The group means seem to show that the optionality found in the judgement of ungrammatical forms is mirrored in the judgement of grammatical ones. SLI children are found to reject grammatical forms at a rate of 33.9%, which does not differ significantly from their rejection of the ungrammatical form. It is a prediction of the broader grammar proposals that the SLI child's ability to correctly judge the grammatical form should not be affected. Given the proposal of a more inclusive grammar it would be expected that a wider range of forms would co-exist as grammatical constructions for the SLI child. However, the finding that these forms are only optionally accepted implies that the grammatical form is optionally ungrammatical for the SLI child.

These two findings cannot be captured by the broader grammar proposals, since their implication is that the forms do not consistently coexist. However they are consistent with, and indeed requirements of, the PCA.

The findings from Experiment 4 appear to show that, for the SLI child, one form is optionally supplanting the other as optimal. And that the child has two separate grammars between which he/she alternates, one specifying the grammatical form as optimal, and another specifying the ungrammatical form as optimal.

This result is a direct prediction of the PCA which the other accounts, to date cannot explain.

4.3.5 Scope

In Experiment 5, I examined the children's interpretation of a set of ambiguous sentences. The ambiguity of the sentences related to the multiple scopal configurations which could potentially hold for a pair of scope taking elements (*all* and *not*). While one of these possible interpretations corresponded to the surface order of the sentence, the other could only be derived by accessing its underlying structure. The focus of Experiment 5 was to see if the SLI child could access this second 'structural' interpretation.

The question of whether this underlying structure is available to the SLI child is important when we consider Generalisation 3, repeated here in 25:

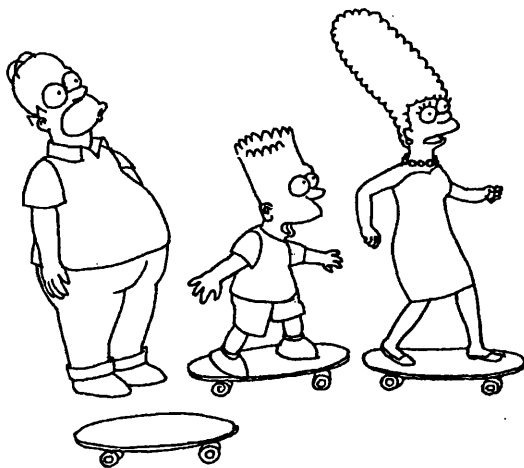
25. **Generalisation 3:** The SLI child's language displays true optionality.

Generalisation 3 crucially proposes that when problematic elements are produced correctly, this reflects their legitimate derivation, that is, as it is derived in ND. As discussed in section 2.4.3, this view contrasts with the proposals of researchers such as Gopnik, 1990 and Clahsen, 1991 who suggest that the appropriate use of problematic elements does not reflect the optional application of normal processes. In this section I will compare the predictions of this account with predictions of the PCA.

As discussed in Chapter 2, both proposals are able to account for the optionality of the children's production. Equally, both accounts suggest possible analyses of the optionality in comprehension. As such, it is particularly important to find a domain in which the proposals make different predictions. In Experiment 5, I examined one such domain. As discussed, the value of examining scopal ambiguity is that two possible interpretations can be made available to the child which differ only on the basis of their structural representations. While one representation is available to the child because it corresponds to the PF representation, the other should only be accessible if the underlying structure of the sentence is available to the child. In Experiment 5 the children were presented with a sentence similar to that in 26:

26. All of the Simpsons are not skateboarding

In addition they were presented with a picture similar to that in figure 10:



As in Experiments 1 and 2, the child was asked to decide whether the sentence accurately described the scene depicted in the picture. However, in this case there was no incorrect response. If the children's response was No, then this suggested that they had adopted the interpretation in which the quantificational element took scope over the negative element, and if the response was Yes then the converse scopal configuration was assumed to hold. Given the design of the experiment, the choice should have been completely optional. The presentation was made in a set randomised order and each test condition was randomly distributed between a large number of 'control' conditions, for which an incorrect answer could be given. Now let's consider the predictions of the two accounts.

Accounts of SLI such as the Missing Feature Hypothesis (Gopnik, 1990) and the Agreement Deficit Hypothesis (Clahsen 1989,91), which assume that various problematic elements are absent from the SLI child's grammar, suggest that only the inappropriate omission forms of a sentence are truly representative of this grammar. As such, given the parameters of Experiment 5, we can deduce that these approaches would predict that the child would only ever interpret the sentence in a way which corresponds to the surface configuration. This is because if we assume that the problematic ND processes never take place, then the child would be unable to access the LF structure of the sentence and derive the alternative scopal configuration through which the ambiguity is derived.

The PCA, however, makes a quite different set of predictions for these experimental conditions. It holds that both the correct and incorrect form of the sentence equally represent the SLI child's grammar. As such, in the cases where a movement operation takes place, the child would have access to the 'structural' interpretation of the sentence. Consequently, the PCA, in contrast to Gopnik's and Clahsen's accounts would predict that the children would optionally select the 'Yes' interpretation of the sentence.

Now let's examine the findings from Experiment 5. The proportions of Yes vs. No responses are represented below in table 18:

	SLI n = 13	LA1 n = 11	LA2 n = 11	LA3 n = 11
YES	2.85	2.64	2.18	2.45
NO	3.15	3.36	3.82	3.55

Table 18

As can be seen above, the SLI children responded 'yes' to a high proportion of the test items. In addition, 'yes' responses accounted for a higher proportion of the SLI group's answers than for any of the other control groups, though this difference did not prove statistically significant. Both of these findings conflict with the predictions of a Gopnik/Clahsen type account. However, they are consistent with an account such as the PCA which assumes that the correct form of a sentence is a product of the SLI child's grammar.

While this finding points to the conclusion that the SLI children must have been working with access to the sentence's underlying structure, it could be argued that there were certain surface cues, such as intonation which could have pointed the SLI subjects in the direction of the 'structural' interpretation. That is, while the 'structural' interpretation was not syntactically accessible to the child, certain phonological information may have guided their responses.

The methodology employed in Experiment 5 controlled for this possibility. While a real speaker was used for the presentation, this was recorded in a set random order so as to maintain consistency of presentation. While I did not control for intonational cues, if this information did have a significant effect on the children's interpretation then we would expect to find that the SLI children consistently answered 'Yes' to certain items, and only those items. As my analysis in Chapter 3 demonstrated, however, this was not

the case. In table 19, below, the proportion of yes and no responses for each of the six experimental items is given.

		SLI	LA1	LA2	LA3	CA
AC	Yes	1.85	2.18	1.09	2.18	1.82
1	No	4.15	3.82	4.91	3.82	4.18
AC	Yes	1.85	2.73	1.09	1.64	1.82
2	No	4.15	3.27	4.91	4.36	4.18
AC	Yes	3.23	2.73	2.18	2.73	2.55
3	No	2.77	3.27	3.82	3.27	3.45
AC	Yes	2.31	2.73	2.73	2.73	2.31
4	No	3.69	3.27	3.27	3.27	3.69
AC	Yes	5.54	5.45	5.45	5.45	5.54
5	No	0.46	0.55	0.55	0.55	0.46
AC	Yes	1.38	0.00	0.55	0.00	.18
6	No	4.62	6.00	6.00	6.00	5.82

Table 19

Table 19 clearly shows that there was at least some optionality in all of the experimental items. This suggests that intonation was not the major factor in the children's choice.

In summary, the findings from Experiment 5 are consistent with the predictions of the PCA and Generalisation 3 which states that the SLI child's grammar specifies both the ND form and the ungrammatical omission form of their production.

4.4 Derivation by Phase

Chomsky, 2000 and 2001, attempts to refine and further extend some of the ideas developed in the Minimalist Program (Chomsky, 1995). While these 'inquiries' are tentative they mark a number of significant departures from the 1995 grammar, which have a bearing on the analyses I developed at the opening of this Chapter. In this section I will provide a brief discussion of the major developments proposed in these works, before considering their impact on the theoretical status of my account.

If we start with the basics, the formal features of a category may be distinguished on the basis of their interpretability at LF. As before, there are two specifications for interpretability: + or - interpretable. However, in the 2000, 01 grammar, the meaning of interpretability has been redefined slightly; to say that a feature is uninterpretable means that it is 'unvalued'. While we may know that a feature marks structural Case, for example, the specification of that feature (say Nom or Acc) is assumed to be a reflex of a

syntactic operation. This is a departure from the 1995 grammar, which took this property to be intrinsic to the feature prior to its entry into the computation.

Chomsky also attributes three major operations to the syntax. The first is Merge. Merge is the operation by which two syntactic objects α and β are combined to form the new object $\Gamma = \{\alpha, \beta\}$. As before this forms the fundamental structure-building component of the computational system for human language. The second operation is Match. Match refers to the establishment of a relationship between two compatible features, or sets of features. Compatibility does not require that the two features are the same, since some are unvalued, but it does require that they are non-distinct (i.e. a person feature cannot match with a Case feature). When the uninterpretable features of a lexical item *match* with features of the appropriate type they induce another relation which holds between those two lexical items. This brings us to the third operation, Agree. The relation *Agree* may hold between two matching categories so long as they are found in the appropriate configuration. If these conditions are met then the uninterpretable features of the matching categories may delete under agreement. This process is required for the convergence of the derivation.

There are a number of conditions which need to be met before *Agree* can apply. First, both the Probe (the term used to describe the category which searches for a matching set of features, its Goal) and the Goal must be *active*. A category is rendered active if it possesses uninterpretable features. Once all of a category's uninterpretable features are deleted it becomes inert, unavailable to agreement relations. Secondly, an element must have a complete set of ϕ -features (ϕ_{comp}) in order to delete the uninterpretable features of the paired matching element. If an element does not have, or has an incomplete set of, ϕ -features then it is classed as *defective* and would be unable to delete the set of features on a paired matching element if that element has a complete set of ϕ -features. To give an example, infinitival T is defective (T_{def}) and as such, would not be able to delete the features of any nominal merged in its spec, although this does not exclude the nominal from valuing and deleting the uninterpretable features of the defective T.

So what about the movement operation? In the 2000, 01 grammar movement is seen as a composite operation, the product of a combination of processes (*Agree*, *Pied*

pipe and Merge). As such, Move is more complex than Pure Merge and Chomsky formalises the intuition that Merge is the less costly of the two operations, and can motivate Merge's pre-emptive quality over Move³¹. Chomsky also suggests that if we take this view of Move then two apparent imperfections of language design can be explained. He argues that both the process of *Agree* and the specification of uninterpretable features may not be imperfections by virtue of their role in establishing the property of displacement (Move) which has external motivation in terms of semantic interpretation and processing considerations, the computational system's 'design specifications'³².

Move is the realisation of the displacement property of language. In the 2000, 01 grammar it is implemented in the following way; first, the uninterpretable features on a head select it as a target for movement, for example the ϕ -features of T make it active, and its EPP feature (a selectional feature) embodies the requirement to formulate a Spec-head configuration with an appropriate XP. Second, once identified the target determines the nature of the category which can be moved by virtue of its EPP uninterpretable features. Third, the uninterpretable features on the XP select it as a category to be moved, for example the structural Case feature on a nominal would make it a potential candidate for movement to a spec position.

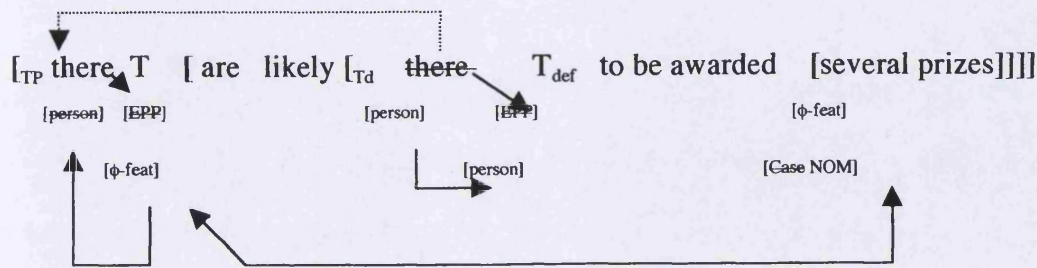
Chomsky provides a number of examples which I'll discuss here:

³¹ A question which might arise at this point is why doesn't Merge always pre-empt Move, given that it is the less costly option? The answer to this question lies in the Numeration analysis of lexical selection which Chomsky assumes. If you recall from the earlier discussion a numeration is a lexical array composed from the lexicon. The possibility of Merging an expletive in the spec of a category is dependant upon whether or not this is specified in the numeration, otherwise the EPP must be satisfied by Movement.

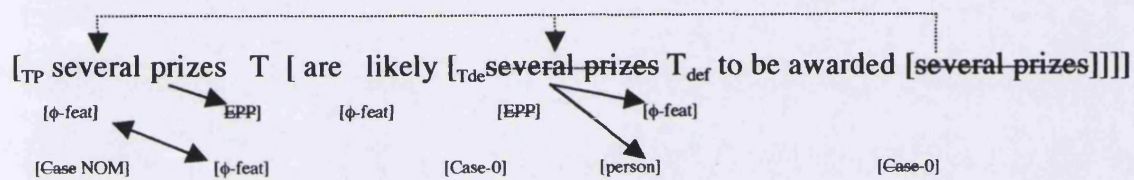
³² In Chomsky, 2001, it is suggested that even movement should not be seen as an imperfection in the system. Chomsky reduces the displacement property of language to a process which he calls 'internal Merge'. He argues that as displacement is 'ubiquitous' in language it must be captured in some manner. "it is hard to think of a simpler approach than allowing internal Merge(a "grammatical transformation") an operation that is freely available. Accordingly, displacement is not an "imperfection" of language", Chomsky, 2001: 8.

27 Raising Constructions³³

a. There are likely to be awarded several prizes

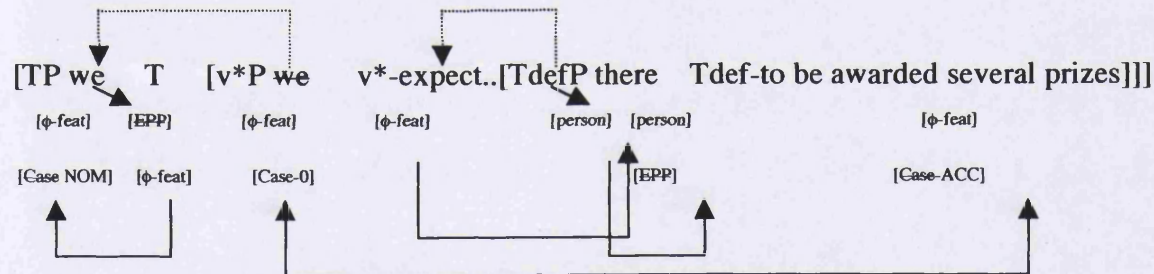


b. Several prizes are likely to be awarded

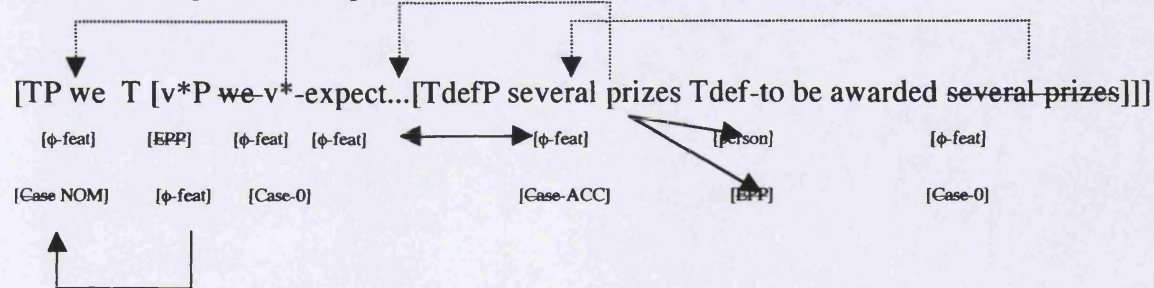


28 ECM Constructions

a. We expect there to be awarded several prizes



b. We expect several prizes to be awarded



³³ Solid lines indicate *agree*. Dotted lines indicate *move*.

As exemplified above, in both Raising and ECM constructions the Case of the subject (there, Several prizes) and its overt location are determined by properties of the matrix probe (T, expect). This is because the head of the embedded TP is defective (Tdef) and, as such, is unable to determine Case-agreement. However, Tdef has an EPP feature, therefore it requires something to be merged in its spec. In the (a) cases an expletive is merged to satisfy the EPP feature of Tdef. In the (b) cases the direct object (several prizes) is raised from its base position internal to the VP to the spec of Tdef in order to check the EPP feature.

In addition, while Spec-T_{def} is filled by either Merge or Move the nominal or expletive merged there will either agree long distance with the matrix probe (T, v*) or subsequently raise to its Spec position to induce agreement. In the examples above, Tdef and the nominals match only with respect to the feature [person]. Therefore, Tdef cannot delete or determine the features of the nominals in its Spec. Consequently, those features remain to be deleted by the matrix probe (T or v*).

In short, the 1998,99 {Dates?} grammar reduces the motivation for displacement to a single feature, movement is only required when an EPP feature needs to be deleted, all other agreement requirements can be satisfied long distance³⁴. This is not to say that there are no restrictions on agreement configurations, however. Chomsky 1999 discusses certain intervention effects which restrict the availability of agreement targets.

For example, if a probe α has uninterpretable features which are compatible with an inactive set of features on another category β which is nearer to it than any other category γ (even if γ is active) then the features of α cannot access γ to induce agreement. In this case β causes an intervention effect.

³⁴Note, Chomsky's adoption of the theta-theoretic principle which states that 'pure merge in theta positions is required of (and restricted to) arguments' explains why EPP features cannot be satisfied by the pure

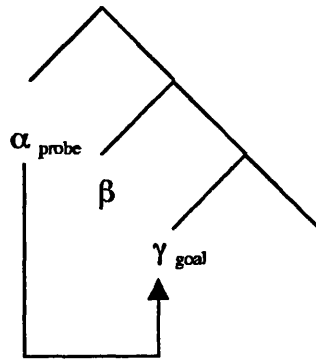


figure 10

However, intervention effects can be cancelled. Consider the two principles below (Chomsky's numbering)

(14) Maximise matching effects - a category which does not have a full set of inactive features cannot intervene between the probe and another category with a more complete set of compatible features.

(17) Under the Minimal Link Condition (MLC), only the head of an A-chain (equivalently, the whole chain) blocks matching.

Chomsky provides a number of examples to demonstrate the interaction of these principles, some of which I'll briefly discuss here;

29. Raising Constructions with Unaccusatives

(a) There is likely to arrive a man

In the raising construction above the expletive *there* is merged in the Spec of T_{def} to satisfy its EPP feature. The expletive subsequently raises to the Spec of the matrix T, once again satisfying the requirements of its EPP feature. The specification of Nom Case for *a man* reflects its agreement with the ϕ -features of matrix T which are simultaneously valued and deleted by this process. The significance of this example relates to the observation that the expletive *there* does not induce an intervention effect which could

merging of arguments in the appropriate Spec- positions.

block the agreement relation between *a man* and the matrix T. This is because the whole chain does not intervene between the Probe and its Target (T and *a man* respectively), principle 17³⁵

30. ECM Constructions

(a) We expect there to arrive a man

In example 30 once again an expletive has been merged to satisfy the EPP features of the defective T. In addition, the nominal *a man* bears Acc Case. This reflects its long-distance agreement with v^* , the process through which the ϕ -set of v^* is valued and deleted. Unlike the previous example, principle 17 does not prevent the intervention effect which may be predicted given the presence of the expletive. This is because the head of the chain intervenes between the probe and its goal. In this case we have a pure example of the effect of principle 14. The presence of the expletive does not cause an intervention effect because it cannot block the entire ϕ -set of *expect*. Instead the ϕ -set of v^* match and agree for the nominal.

At this point I'll turn to the final development to be considered here, phase structure. Briefly, to understand the genesis of Chomsky's concept of 'phases', consider the question of why merger of an expletive does not always pre-empt the raising of an argument. As suggested in footnote 34 (above), this crucially relates to the nature of the lexical array which has been selected. That is, it may or may not make an expletive available to the derivation. Chomsky notes however, that this cannot be the whole story. Consider the examples below;

- 31 a there are questions about [_{α} what C [_{TP} John read t]]
 b it's fun [_{α} PRO to [t go to the beach]]

In both these examples, an expletive is clearly specified in the lexical array, however it fails to pre-empt movement in the embedded phrase α .

In response to this data, Chomsky suggests that we should adopt an even stricter derivational approach. Once a lexical array has been selected from the lexicon, this is further divided into lexical (sub)arrays (LAI) which are placed in "active memory" and

³⁵Note, in this case principle 14 would also prevent intervention.

submitted individually to the derivation. The question becomes; is an expletive made available by the lexical sub-array³⁶.

How, then, are these sub-arrays to be characterised? Chomsky argues that they should determine ‘a natural syntactic object’ suggesting that the most principled choice on this basis would be the closest syntactic counterpart to a proposition; “either a verb phrase in which all theta roles are assigned or a full clause including tense and focus. Call these objects “propositional” (Chomsky, 1999) Phases, then, are either verbal phrases with full argument structure or CPs with force indicators.

Phases are further sub-divided on the basis of their strength. A strong phase is a potential target for movement by virtue of its EPP feature, this includes CPs and ϕ -complete v*Ps, but excludes the defective vP. The notion of strong phases is very significant. First, it is assumed to determine the point of spell-out. In the 2000, 01 grammar, spell-out is assumed to be cyclic. That is, there is no overt-covert distinction, the interpretation/evaluation of a structure proceeds as the derivation itself proceeds. The point of spell-out for one strong phase is the beginning of the next strong phase.

The significance of this cyclicity is that once the derivation of one strong phase is complete, the contents of that phase becomes inaccessible to any procedures which take place subsequently. This property of the computation is realised as the Phase Impenetrability Condition (PIC)

³⁶Chomsky argues that the concept of a lexical sub-array can be viewed as a reduction in computational complexity. This is in the same way that the concept of a numeration (the lexical array) reduces this complexity by eliminating the need for multiple selection processes from the lexicon. As I see it two issues arise from this assumption. First, if we accept the argument that the reduction of the array in active memory constitutes a reduction in complexity, it becomes hard to understand why this logic should not be carried to its conclusion, i.e. that the single lexical item would constitute the optimal lexical (sub)array. While Chomsky 1999 mentions this possibility, the issue is not addressed. Obviously, from a theoretical point of view we can see why Chomsky would not want this to be the case. The reduction of the lexical array to a single lexical item would bring us back to the initial situation of a lexical array made up of individual lexical items. As such the concept of such sub-arrays is only workable if they can be defined as containing more than a single lexical item. A second point relates to the proposition of a lexical array itself. If we were to abandon the assumption that move and merge have a cost distinction (the necessary selection process involved in merge coupled with the process itself equalling the combinatory factor of move, which does not require additional selection) the necessity for a numeration is lost. Chomsky’s argument that a single selection process of x number of lexical items is cheaper than multiple selections of the same number of items is probably flawed, as is the idea that overall computational complexity can be reduced by adding additional concepts. The introduction of the numeration in order to reduce the necessary applications of an existing operation (Select) is a case in point. If we remove the cost distinction then we also can dispense with the proposed pre-emptive quality of merge and the difficulties observed in example 84 are explained through the optional choice of whether to merge or move. Since this proposal perhaps introduces more

The Phase Impenetrability Condition: The domain of H (a head) is not accessible to operations outside HP (a strong phase), but only H and its edge.

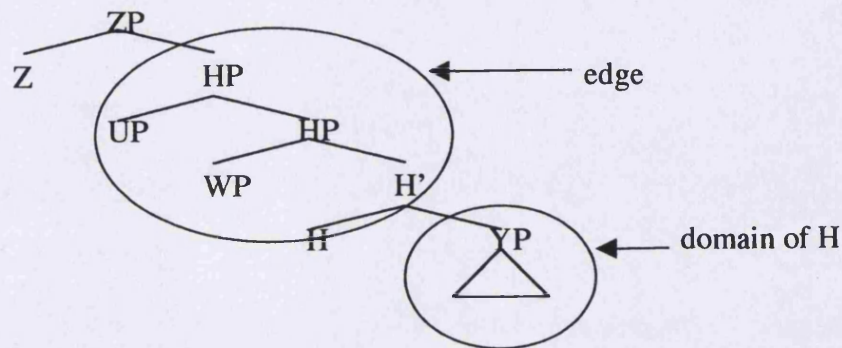
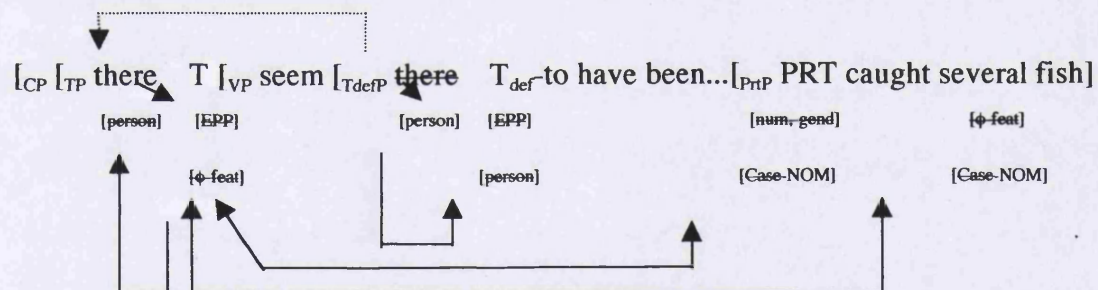


Figure 11.

The cycle is assumed to be so strict that operations cannot 'look into' a phase below its head, although the head itself and its Specs must be visible for selection and head movement. Let's consider some more of Chomsky's examples, to see how the PIC affects the derivation of a sentence;

32 Participial passives - Raising constructions

(a) there seem to have been caught several fish



33 Participial passives - ECM constructions

(b) expect there to have been caught several fish

problems than it solves, I won't labour the point any further.

There is no intervention effect in examples 32 and 33, induced by either the Expl or the PRT, because of the effects of Principle 14. Also, note the way in which Case assignment is divorced from movement; while the direct object *several fish* receives ACC by long-distance agreement with the matrix *v**, the Expl *there* satisfies the EPP of T_{def} without checking any Case.

At this point I'll conclude my discussion of derivation by phase. While the general basis of the 1995 grammar remains, a number of important new developments have been made, as well as some important shifts in emphasis. To consider the impact of these developments on the PCA, I will begin with the issues discussed in section 2 of this Chapter. These were the areas where the specifics of the minimalist framework bore particular relevance to my account.

The first important development concerns the status of Chomsky's strict lexicalist approach. While the 2000, 01 grammar still assumes that a lexical item enters the numeration with its full complement of formal features, these are only assumed to hold an intrinsic value if they are interpretable. Uninterpretable features enter the numeration without an intrinsic value beyond their categorial specification of say [person] or [Case]. The specific identity of the uninterpretable feature is only assumed to be established through an agreement relation in the syntax. This is an important development for the PCA because it supports the principle (outlined in 6, above) that the property encoded by an uninterpretable feature can only be realised as the result of a syntactic operation.

This development is entirely in concordance with the PCA and removes any need for a departure from the standard approach in this respect. As would be required by the PCA, we would be led to predict that any uninterpretable feature which was not involved in an agreement relation would be left unvalued and as such, would not be realised.

Next, consider the issue addressed in section 4.2.3, regarding the possibility that uninterpretable features may survive to the LF interface. I argued that this related crucially to the question of how the principle of Full Interpretation should be defined. The difficulty arose because FI relates to the requirement that all uninterpretable features be eliminated before they reach the interface level. The question was: does FI serve a syntactic purpose or does it merely embody a requirement of the interface?

In the 2000, 01 grammar there is a subtle shift in emphasis which supports my conclusion that the elimination of uninterpretable features is syntactically motivated. I refer to Chomsky's argument that neither the operation *agree* nor the presence of uninterpretable features should be seen as imperfections by virtue of their role in establishing the property of displacement. Chomsky suggests that displacement itself has external motivations in terms of "semantic interpretation and perhaps processing" (Chomsky, 1999; p.3). In effect, this suggests that the presence of uninterpretable features, and the requirement that they be eliminated motivates the movement process which itself is motivated by the requirement to satisfy interface conditions. Though this shift is subtle, it is a significant change from the idea that movement was in fact acting to eliminate the uninterpretable features due to their effect on the interface.

Finally, and perhaps most significantly, let's consider again the question of PF's access to post spell-out operations. The major difficulty encountered by my rejection of the strict lexicalist hypothesis related to the question of how the absence of post spell-out operations which normally took place in the LF syntax could have an effect on the output of the PF interface. These problems can be resolved if we adopt the developments made in the 2000, 01 grammar. According to these developments there should be no 'dual' cycle mechanism at all, there is no single point of spell-out and as such there is no point after which the PF representation does not have access to the derivation. This eliminates the need for a covert stage in the derivation with agreement relations taking place at a distance when not satisfying the requirements of an EPP feature. As both the PF and LF representations have access to the entire derivation throughout its course, the difficulties encountered by the PCA in this respect are eliminated.

So far so good, a number of difficulties encountered by the PCA have been removed by independently motivated developments. However, it will become apparent that these developments have some significant drawbacks for the PCA as it stands. The most significant of these arises from perhaps the most advantageous development, the elimination of the dual cycle, which elegantly side-steps a number of difficult issues, relating particularly to the lexicalist stance. The difficulty relates to the fact that if we eliminate the dual cycle aspect of the grammar, the principle of procrastinate becomes impossible to formulate. Procrastinate plays a significant role in the present formulation

of the PCA, it is one of the two principles which come into conflict. Let's briefly consider Procrastinate and its status.

4.5. Procrastinate

In the 1995 grammar Procrastinate played an integral role, marking the cost distinction between the two cycles of the derivation. It was assumed that economy conditions should exclude not only superfluous movement operations themselves but also anything more than the minimal pied-piping required for convergence. In covert movement, features were assumed to raise alone and Procrastinate expressed the preference for this covert option.

The viability of Procrastinate has been open to question for quite some time and many have argued that it amounts to a stipulation. However, I feel that in the dual cycle mechanism Procrastinate is not only vital but also quite possibly reducible to certain fundamental assumptions. To illustrate, suppose that Procrastinate marks the general tendency to reject any costly operation if it is unnecessary at that particular point in the derivation. Failure to move and check prior to spell-out would not, in most cases, result in a failure to converge (crash) and as such, movement doesn't happen. However, failure to check in the covert part of the derivation would result in a crash, thus checking takes place.

It is a fundamental assumption of the Minimalist framework that a movement operation only takes place if failure to do so would cause the derivation to crash (Last Resort)³⁷, and it is this principle which lies at the root of Procrastinate in the 1995 grammar.

So how does Procrastinate fare in the 2000, 01 grammar? While the underlying principle remains, the need for Procrastinate does not. Given the absence of a second cycle, there is no role for a principle which discriminates between such cycles. Procrastinate cannot be meaningfully formulated

In the next section, I'll consider how the PCA can be reformulated to accommodate the 2000, 01 grammar.

³⁷This formulation of Procrastinate has a number of advantages. First, it eliminates the need to have a principle which is regularly violated to ensure convergence. Second, it eliminates the need for a cost

4.6 Principle Conflict in Derivation by Phase.

The developments proposed in the 2000, 01 grammar have fundamental implications for the PCA. Firstly, given that Procrastinate can no longer be formulated, we must find a new principle to replicate its effect in the SLI child's grammar. While, at first glance, this may seem problematic for the PCA, it was a predictable difficulty which must be overcome by any account formulated within a developing framework. Perhaps the hallmark of a robust account is its ability to adapt to these changes if they are principled.

In addition, consider the role of movement in the reformulated framework. The transformational component of the grammar has a drastically reduced domain of influence, relations which were facilitated by movement in the 1995 grammar are now established at a distance unless regulated by the presence of an EPP feature³⁸. If the PCA is still to account for the full range of SLI children's difficulties then the deficit must relate to the child's ability to establish agreement relations (local and distance).

The motivation to establish agreement relations is determined by the specification of uninterpretable features on lexical items. As such, if we hope to reformulate the PCA within the 2000, 01 grammar, we must identify the principles which regulate the presence of uninterpretable features. The most obvious of these is FI which relates to the elimination of uninterpretable features. But if FI forces their elimination, what forces their insertion?

First, let's consider the question of whether the insertion of uninterpretable features even requires regulation. Although Chomsky does not deal directly with this question, he seems to imply that they do not:

"does L (language) have these properties or not? If it does (as appears to be the case), we have to recognise the fact and seek to explain it: in the best case by showing that these are only apparent imperfections, part of an optimal solution to design specifications" (Chomsky 1999, p.3)

distinction

³⁸Chomsky (2001) makes significant departures from Derivation by Phase, extending the application of

In Chomsky's terms the specification of uninterpretable features is only an apparent imperfection by virtue of their role in establishing the displacement property of language. This appears to suggest that uninterpretable features are more a 'quality' of human language, that they are ultimately a requirement of the computational system as, for example, is structural determinacy. If this is the suggestion, I feel it is incorrect, for reasons I'll explain.

Take the syntactic category noun. Although it would be easy to imagine a possible numeration which does not contain any nouns, the lexical array (LA) which produced this numeration could never produce a convergent derivation, the theta criterion amongst many other principles would be immediately violated. To illustrate this point, consider the examples in 34;

- 34 a. *He hit
 b. *He slept Betty all night

Clearly both 34 a and b are ungrammatical. The most obvious reason for this is that *hit* in 34a subcategorises for an internal argument and *slept* in 34b does not. Accordingly, it seems that the component which regulates the insertion of nouns is the theta principle. If we were to argue that uninterpretable features do not require the same form of regulation then we should be led to predict that a derivation arising from a possible lexical array could never incorrectly converge or fail to converge because of the inappropriate specification of uninterpretable features.

Let's examine this empirical prediction. Consider example 35:

- 35 *He sleep

Why is example 35 ungrammatical? The most obvious answer is that the ϕ -features on the verb don't match the ϕ -features on the subject. In 2000, 01 terms this would indicate that the interpretable ϕ -set of the subject had failed to value the ϕ -set of the verb due to incompatibility or some other factor. However, this is not the only option. Imagine that the verb had been selected without its uninterpretable features. Such bare forms clearly exist (consider example 36) and are specified in the lexicon.

EPP features. However, the essence of the point remains the same.

36 It's necessary that he sleep

As such, there must be a possible lexical array which matches exactly the array from which *he sleeps* is formed with the exception that it contains the bare form of the verb. This observation is important because it indicates that the insertion of uninterpretable features must be regulated. Example 35 is ungrammatical. However, given the appropriate lexical array, there is no reason why it should not surface. As such, we should be forced to conclude that there is some principle which insures that a given derivation receives its appropriate complement of uninterpretable features.

What then, is the nature of this principle? Clearly, to avoid stipulation, it should relate to some checking requirement. In addition, the principle should relate to the agreement relation, which is motivated by the presence of uninterpretable features. As a first approximation consider the implications of 37;

37 Every feature requires checking

If we accept 37 then one of the fundamental distinctions between + and - interpretable features is eliminated. I refer to the assumption that only uninterpretable features require checking. This is not so outlandish as it might first appear. Consider movement under the 1995 grammar. There were four types of features differing on the basis of interpretability and strength. Uninterpretable features required checking, irrespective of their strength. Interpretable features only required checking if they were strong, otherwise they could remain unchecked. This distinction seems a little unprincipled. If we have overt evidence which suggests that interpretable features need to be checked, why assume that this is not also the case in the covert syntax? It also creates a problem for the concept of feature strength. It is one thing to say that a necessary checking operation needs to take place prior to some point in the derivation, but quite another to say that this requirement can motivate an operation which otherwise would not take place. It is difficult to see how the interface conditions at PF could motivate such a move.

Another factor that should be considered is that under principle 37 uninterpretable features have a clearer role in syntactic structure. Their insertion ensures that the necessary components of a structure that are not intrinsic to the lexical items are

in place. In a sense the role which the theta criterion plays in the insertion of lexical categories, uninterpretable features might play in the insertion of non-intrinsic information.

In effect principle 37 regulates the insertion of uninterpretable features. It achieves this by stipulating that every formal feature which enters a derivation must be checked against another non-distinct formal feature forming part of another category in an appropriate configuration. Needless to say, the non-distinct features are uninterpretable features and if an insufficient complement of them is inserted the derivation will fail to converge by principle 37.

Now let's consider some of the drawbacks of principle 37. Most obviously, it would require more movement (or agreement relations in 1998,99 terms). This should not be problematic however. The efficiency of a computational system should not be measured on the number of applications of a process which it requires but rather on the number of actual processes it proposes. Once a process is proposed it should be applied whenever this is motivated and an additional principle should not be proposed to reduce this motivation³⁹. We would not propose a syntactic principle to reduce the applications of merge in a computational system, this is a direct product of the numeration and the requirement that it be exhausted. Equally, because movement (agreement) is motivated by some property of a lexical item, this cost is the product of that selection. However, I'll labour this point no further.

The proposal of principle 37 revives a previously outstanding problem concerning inherent Case. Standardly, a nominal is assumed to receive inherent Case from the category which also assigns it a θ -role. Thus, in examples 38a and b the noun *destruction* which θ -marks *Rome* can also assign genitive Case, which is realised through *of*-insertion in 38a and as *'s* in 38b.

- 38 a destruction of Rome.
 b Rome's destruction.

What was unclear, however, was how the ϕ -features of the nominal receiving inherent

³⁹This is not to say that there shouldn't be any principles which limit the application of costly operations, just that these should only apply to the choice between competing derivations.

Case can be checked, in the absence of any plausible functional category. Under Chomsky's 1995 analysis, this was no longer a problem. Since the ϕ -features of the nominal were interpretable, they did not require checking at all. If we adopt 37, however, this problem resurfaces.

A plausible solution could be to suggest that the element which assigns Case to the nominal also checks its ϕ -features. At first glance this analysis may seem a little ad hoc. However, if we take it in the light of the 1998,99 grammar, a proposal along these lines would be required, in any case, if we are to maintain the standard analysis of inherent Case assignment. As discussed, in the 1998,99 grammar, Case is not assumed to be assigned directly. Rather, it is the product of agreement relations. If we assume that this process is uniform⁴⁰ then the nominal can only receive its Case value as an artefact of an agreement relation which in this case would hold between the nominal and its θ -assigning category. This analysis clearly needs ironing out, there are a number of problems which immediately occur, for instance, relating to whether both of the categories are active and/or complete. However, these are issues which also bear on the issue of inherent Case assignment and should not present too many problems.

For my purposes, the exact nature of the principle which forces the insertion of uninterpretable features is not of great importance. The significant issue is that there is a requirement for such a principle. For now I'll assume that principle 37 is essentially correct.

Having identified the two principles which regulate the specification of uninterpretable features in the computation, I'll turn to the question of how the PCA can be reformulated in the revised 1998,99 grammatical framework. As discussed, in order to maintain the scope of the account, it must relate to the SLI child's application of the relation Agree rather than to the transformational component of the grammar. Agree will be vital to the account of SLI not least because many of the elements which are problematic for the SLI child surface directly as a result of this relation. As discussed in section 4.2.1 (above) one of the major difficulties encountered by the PCA related to the lexicalist stance assumed by Chomsky in the 1995 grammar. The assumption that

⁴⁰As it must be, given Chomsky's assumption that uninterpretable features are valueless. As such, a case feature could never receive a value through checking against another case feature.

uninterpretable features receive their value through a syntactic relation eliminates this difficulty. It becomes unproblematic to assume that the absence of a syntactic process could result in the omission of an inflectional element.

Given the characterisation of SLI which I assume, it seems reasonable to propose that the inaccuracies in SLI children's language could be the product of their intermittent failure to establish obligatory agreement relations. If this is so, the question that needs to be addressed is what is the nature of the deficit that could account for this characterisation? As I have suggested, it should relate to the specification of uninterpretable features, the driving force for agreement. The most obvious candidate would be to propose that principle 37 was absent in the SLI child's grammar. Let's consider this possibility.

We have already discussed some of the difficulties which principle 37 overcomes. Example 35 can only be excluded if we make the assumption that the insertion of uninterpretable features is regulated. However, the implications of proposing principle 37 run much deeper. In addition to the uninterpretable features of verbs, principle 37 must regulate the insertion of all non-intrinsic information in the derivation. A grammar without principle 37, therefore, would be free to produce derivations with or without this information at random. The fact that these elements are now optional means that a wider range of numerations can now produce convergent derivations and these are all admissible because they are derived from distinct numerations which, in principle, are not open to comparison on economy grounds.

This proposal is too simplistic, however. While it provides a neat solution to the optionality problem, it cannot account for the full characterisation of the disorder. In particular, it would be unable to account for the deficit in the children's comprehension. For example, the children's difficulty with the interpretation of information encoded by agreement relations would not be predicted by this deficit. The absence of principle 37 produces a less restrictive grammar which admits an extended range of possible derivations. However, since the full range of these possibilities is always available, the child should have no problem accessing the appropriate interpretation for a grammatical sentence. In this sense, this proposal essentially amounts to a broader grammar account of the form discussed in section 4.3.4. This brings us to our second difficulty. As discussed

in Experiment 4, the predictions of this type of account are not borne out empirically. In particular it is unable to explain the finding that SLI children will optionally reject grammatical structures in favour of their ungrammatical counterparts. In this sense the SLI child's language seems to be truly optional, with an additional range of possibilities which optionally supplant one another. While the absence of principle 37 would allow the child to accept the ungrammatical examples, it would not lead us to expect them to reject any of these possibilities, much less the grammatical form.

A more sophisticated account of the disorder needs to be developed. Accordingly, I will attempt to import the theoretical basis of the PCA into the framework of the 1998,99 grammar. As before, the PCA will require (at least) two principles which, as the result of some deficit, conflict on the basis of their influence on the course of the derivation. Given the assumption that the divergency of the SLI grammar relates to the application of agreement relations, one of these principles must embody the requirement for an agreement relation to take place while the other must embody the requirement that it does not.

As I have suggested, these two principles are FI (Full Interpretation) and principle 37. While both coexist unproblematically in the ND grammar, I propose that, for some reason, they come into conflict in the SLI child's grammar.

Principle 37 requires that a sufficient amount of uninterpretable information needs to be present to complete necessary checking operations. FI specifies that a derivation cannot converge unless all this uninterpretable information is eliminated prior to the interface levels. However, imagine a situation in which uninterpretable information cannot be eliminated from the derivation. While principle 37 would still require checking operations to take place, FI would prohibit the insertion of the necessary uninterpretable information. This is because in a situation where uninterpretable information cannot be eliminated, FI would predict that no numeration containing this information could converge. Given these assumptions, we can imagine a situation in which FI and principle 37 might come into conflict.

But what is the deficit? In the 1998,99 grammar the elimination of uninterpretable features forms part of the agreement process. Features Match and induce agreement and, as a result, uninterpretable features are deleted. In the SLI child's

grammar, however, I propose that this deletion property of the agreement relation is missing. The SLI grammar performs the matching operation which induces agreement, however, once the operation is complete the uninterpretable features do not delete, they remain, violating FI.

From this position we have a conflict between the two principles. The SLI child is faced with the optional choice of which principle to maintain. If FI is upheld, then uninterpretable features are prohibited from entering the derivation. Alternatively, if principle 37 is upheld, then the requirement that the features be inserted remains. As before, the principle choice is taken to be completely optional and holds intrasententially, that is, each time the principles come into conflict in a derivation⁴¹.

In summary, I have proposed a reformulation of the PCA constructed within the 2000, 01 version of the Minimalist framework. As in the previous account, this involves two principles which, due to a deficit in the child's computational system, conflict. As before, each principle specifies a different set of convergent derivations. However, whereas previously the conflict related to a single lexical array, now it holds across multiple arrays and numerations. In the previous version of the PCA, the question was what is the optimal derivation from a given numeration? However, now the question is which numerations can derive an admissible derivation. The distinction may or may not be significant.

While it is doubtless the case that there are many difficulties to be addressed with respect to this new proposal and the PCA in general, I feel that this is a good place to begin. I have demonstrated that the PCA is suitably robust to accommodate changes in the theoretical framework which provides its basis and I am hopeful that it will continue to do so. At this point, I will turn to my conclusion and consider some potential new directions.

⁴¹Although, this concept most likely needs sharpening. It seems likely that principle choice would only have to take place once per lexical item e.g. Once per ϕ -set rather than once per ϕ -feature.

Chapter 5.

5.1 Summary

The object of this thesis has been to achieve two goals. The first is the development of an explanatory account of SLI that can effectively capture the variety and complexity of the children's grammatical deficit. The second is to embed this account within a restrictive theoretical framework.

Before embarking on either of these tasks, a clear characterisation of the children's deficit had to be established. It was clear, even in the preliminary stages of my research, that the traditional conception of SLI children's deficit as being restricted to the domain of inflectional morphology was fundamentally flawed. Accordingly, in Chapter 2, I adopted a much broader characterisation of the children's deficit of the form advocated by Heather van der Lely in her RDDR research program. In addition to inflectional morphology, I presented data from a range of domains, like reference assignment, which the more restrictive characterisations could not accommodate.

Subsequently, in Chapter 2, I proposed that the range and extent of SLI children's deficit could reflect problems with the application of the movement process, I argued extensively for this point of view and cited empirical evidence which appears to demonstrate relatively pure examples of the children's failure to apply the movement process.

This proposal formed the first part of my characterisation, relating to the range of the children's deficit. This was then supplemented by three generalisations which I proposed with respect to the nature of their deficit. These generalisations are repeated below.

Generalisation 1: SLI children's deficit relates to both their productive and receptive abilities.

Generalisation 2: SLI children's errors are uni-directional in their nature.

Generalisation 3: The SLI child's language reflects true optionality.

Each of these generalisations were discussed in some detail in Chapter 2, so I won't embark on too deep a discussion here. However, they all relate to the question of how the elements which are subject to the children's deficit are affected. They provide a basis for any theorising about the exact nature of the children's deficit and how this can be explained. To take each generalisation in turn, Generalisation 1 relates to the question of where exactly the SLI child's deficit is located. It embodies the proposal that the deficit relates to the child's linguistic knowledge, rather than to the processes which access this knowledge. Generalisation 2 relates to the restrictions which pertain to SLI children's language, suggesting that it is still constrained in a number of meaningful ways. Finally, Generalisation 3 relates to the question of how much of what SLI children produce truly reflects their underlying grammar, suggesting that, to a degree, everything does⁴².

These proposals reveal both the range of the deficit and the nature of its effect. Combined, they constitute a relatively clear characterisation of SLI children's language and provided a basis from which I could proceed to formulate an explanatory account of the disorder.

The task of explaining the children's deficit was especially difficult because of the apparent incompatibility between the SLI child's linguistic production and the minimalist framework. In particular, I refer to the optionality in the children's language. If Generalisation 3 is correct, then the child appears to be able to access more than one optimal derivation from a single numeration. This is fundamentally at odds with the predictions of the minimalist architecture, which suggests that only the least costly convergent derivation can be derived from any given numeration.

At the end of Chapter 2, I begin to formulate an explanatory account which can accommodate the complexities of SLI children's language. I propose that two of the principles that make up the computational system for human language come into conflict in the SLI child's grammar. Both of these principles refer to the movement process; one states that syntactic movement is obligatory and the other states that it is prohibited. Whenever movement is normally required, these two principles will come into conflict. When principle conflict occurs, the child's grammar will be faced with the choice of

⁴²I'll return to this point later in this Chapter.

which principle to reject and which to maintain. On the basis of this choice, the movement process in question will either be omitted as unnecessary or occur as normal.

I argue that principle choice should be completely optional and be made intra-sententially, that is each time movement is required *within* a derivation. I also liken the SLI child to having two grammars, one which requires movement and the other which prohibits it. This is a crucial property of my proposal. It allows me to differentiate between my account and others that propose that the SLI child simply has a broader or more inclusive grammar. In Chapter 3, I presented an experiment which considered this factor. Experiment 4 examined the grammaticality judgements of a group of SLI children. I found that the children not only (optionally) accepted the ungrammatical omission forms, but also (optionally) rejected the grammatical specified forms. This was an extremely significant finding because it indicates that, at certain times, the grammatical form is not permitted by the child's grammar. If we adopt the broader grammar stance, in which the SLI child merely has a wider range of grammatical options, then none of these should ever be judged as inadmissible. These findings strongly support the dual grammar approach of the PCA, in which one form is assumed to optionally supplant the other as optimal.

In total, five experiments were presented in Chapter 3. They all examined aspects of syntactic negation, a domain which has received little attention in SLI research. This not only provided a new perspective, but also allowed me to re-examine some of the more fundamental characteristics of the children's language. The experiments assessed a range of different aspects of negation, including the production of simple negative sentences and conjoined negatives, the production of negative subject and object questions, the comprehension of simple negatives and negative scope, and the children's ability to judge the grammaticality of negative sentences. Obviously, a particular focus was to establish the generalisations proposed in Chapter 2. For example, the results from Experiment 1, which assessed the children's ability to formulate simple matrix negatives, bore particular relevance to Generalisation 3. It was found that the SLI children optionally produced commission errors by inserting inappropriate forms of the auxiliary verb. However, detailed analysis revealed unexpected regularities in the distribution of the over-production. The commissions only occurred when a contracted form of the

negative particle was used. On this basis, I argued that Generalisation 3 could be maintained, because the insertion of the contracted negative form clearly forced the commission of the attached auxiliary. I refer the reader to Chapter 3 for a more detailed discussion of this and the other experiments.

In summary, all of the findings reported in Chapter 3 support my analysis. While there are still many questions that remain unanswered, these results seem promising and suggest that my proposals may be on the right track. Finally, in Chapter 4, I considered the theoretical status of my account in more detail. I examined some of the most recent developments in the minimalist framework, and modified the specifics of my account to incorporate them. However, I was able to maintain the basis of my proposals, housing the concept of principle conflict.

In the next subsection, I will briefly consider some open questions and ideas for future developments.

5.2 New directions

A debate which lies at the centre of SLI research is the conflict between input-processing accounts and grammar specific accounts. Although I have examined proposals from both traditions, arguing that the input-processing account should be rejected, the question is to some extent still open and needs to be revisited.

There are a number of established findings which suggest that neither position can be the full story. For example there is good evidence that processing considerations are a factor in SLI children's performance. Experiments have shown that, in many cases, as the demand on general processing capacity increases, the SLI child will make a greater number of errors (Leonard, 1992). However, research also appears to show that the elements which are affected in SLI children's language are not necessarily those that we would expect to be vulnerable given the proposed processing limitations. Rather, they conform to those involved in the formation of specific grammatical relations, as would be predicted by a grammar-specific account.

I would like to propose a hypothesis that works to provide a synthesis of these two approaches. The proposal is that while a grammar-specific deficit initially underlies the children's problems, as they mature non-linguistic factors such as processing

considerations become increasingly relevant to their performance. Under this view the deficit is not seen as a delay in normal linguistic development, as is advocated in many accounts (e.g. Rice et al., 1995), but rather as a constant from which the child may never recover. From this basis, the SLI child has a core deficit which is defined in terms of the grammatical elements or relations that are affected. As they mature, the apparent improvements in their language reflect an increasing reliance on the application of the non-linguistic cognitive strategies which are characteristic of second language learning. The child implements these strategies because they are aware that one of the options supplied by their grammar is incorrect. However, this ability is dependent upon general cognitive strategies and, as such, would be vulnerable to changes in processing demands, accounting for the observation that as processing increases so do errors. As such, I partially reject Generalisation 2 (or rather modify it). While I maintain the stance that the child's grammar specifies both the grammatical and ungrammatical forms (optionally), I allow for the possibility that the child may utilise compensatory strategies to overcome their grammatical deficit. This is not really at odds with my proposals: note that in my discussion of *wh*-questions I allow for the possibility that a compensatory strategy ensures the specification of a sentence initial *wh*-element. Also it seems to explain the effortful nature of the children's language as well as their apparent recovery.

If I consider the question of how my own proposal might best develop, I can think of no more valuable direction than to consider cross-linguistic evidence. This thesis has almost exclusively focused upon the language of English speaking SLI children. A logical step in the development of my proposal would be to consider them in light of cross-linguistic variations. In Chapter 2, I very briefly looked at some cross-linguistic studies. Their findings look promising, though this is very early days. Perhaps the most important reason for studying SLI across languages is that the children's profiles appear to vary as a factor of the characteristics of the language they are acquiring. While SLI in English is perhaps the best understood, certain characteristics of the language, for example its impoverished morphological system, mean that perhaps important generalisations are obscured. The greater the number of grammatical systems we study, the better the picture of SLI we can develop.

5.3 Conclusions

To conclude, in this thesis I have attempted to refine our understanding of SLI as a linguistic construct. I have proposed a detailed characterisation of the children's language, which not only focuses upon the domains of the deficit, but also the nature of this deficit. In Chapter 3, I presented a series of experimental studies which test the predictions of this characterisation, and the fledgling account I proposed as its explanation (the PCA). The findings from these studies were supportive of my proposals and have informed the further developments of my explanation of the disorder.

The modification of the PCA has also taken into account developments in the underlying framework that provides its basis. The fact that I have been able to translate the account into the latest version of the Minimalist Program, and in some cases anticipate these developments, speaks for the robustness of the underlying concepts on which it is based. While there is doubtless much work to do, I have made some valid steps and have presented research findings which I hope can inform further developments in the field.

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Appendix 1: Transcripts of LA sentence production

LA1/21:

1. No... 'cause they're all running
2. Yes... 'cause they're standing
3. No... because they are
4. No... 'cause he's not skate boarding
5. No... 'cause they got balloons and he hasn't
6. Yes... 'cause they're not on their skate boards
7. No... because they all have balloons
8. Yes... because their hats are Ina pile
9. No... because they've got their hats on
10. No... because they've got balloons
11. No... because they're running
12. Yes... they're standing up

13. No... 'cause he's not skateboarding
14. No... 'cause they've got broken legs but he hasn't
15. No... because he... they have hats and he doesn't
16. Yes... because he isn't
17. Yes... because they're standing still
18. No... 'cause those still have and he hasn't
19. Yes... because they're all running
20. No... because they all have hats
21. No... because those two are running
22. Yes... because he hasn't got a balloon
23. Yes... because they're not wearing the hats
24. No... because they're skipping and he's not
25. No... those two are skipping and he's not
26. No... because they're standing still
27. No... because they've got their hats on
28. No... because those two have got balloons
29. No... 'cause they're standing still
30. No... 'cause they're not wearing them
31. No... because they are
32. No... because he hasn't got a hat
33. No... because they all are skipping
34. No... because they're standing still
35. No... because they all got broken legs
36. Yes... because they haven't got balloons
37. No... because they've all got broken legs
38. No... because they've all got broken legs
39. No... 'cause they're standing still
40. Yes... because they're standing still
41. No... because they are
42. No... 'cause they have and he hasn't
43. No... because they've all got balloons
44. no... because they're standing still
45. No... because they are and he isn't
46. No... because they got hats and he hasn't

47. No... because they are
48. Yes... because they haven't got balloons
49. Yes... because they are standing up
50. No... because they all are skateboarding
51. No... because they all are skipping
52. No... because they are running and he's not
53. Yes... 'cause they are standing still
54. Yes... because they're not running

LA1/22:

- 35 Wrong... because they are running
36. Right... because they haven't got sticks
37. Wrong... because they are
38. Right... because the daddy one isn't
39. Right... because the daddy one hasn't got a balloon
40. Right... because the daddy one wasn't skating and the mummy wasn't and Bart Simpson isn't
41. Wrong... because the daddy had one and the boy one had one and the mummy one got one
42. Right... because all the hats are there
43. Wrong... 'cause they have
44. Wrong... because they have
45. Wrong... 'cause two of them are
46. Right... 'cause they haven't got stick
47. Right... because the daddy one isn't
48. Wrong... because the daddy one and the mummy one have
49. Right... because the daddy one and the mummy one have one and the baby one hasn't
50. Right... because the baby one isn't
51. Right... because their legs not moving they're just standing about
52. Right... because the mummy and daddy only have broken legs
53. Wrong... because they are
54. Wrong... because they all do
55. Right... because the daddy one isn't
56. Right... because the daddy one hasn't
57. Right... because the hats are down their
58. Right... because the mummy and daddy ones are only skipping

59. Wrong... because the mummy and daddy one are
60. Right... because they're just standing
61. Wrong... because they have
62. Right... because the daddy doesn't... hasn't got one
63. Right... because their skipping ropes are on the floor
64. Right... because they're just lying on the floor
65. Wrong... because they are
66. Wrong... 'cause the mum and dad have
67. Wrong... because they all are
68. Right... because they're not
69. Wrong... because they have sticks
70. Right... because they haven't got balloons
71. Wrong... because they have those sticks
72. Wrong... because they're not looking happy
73. Right... because they...they are not holding string
74. Right... 'cause they're not standing on the skateboard
75. Wrong... because they're standing on the skateboard
76. Right... because the baby one hasn't got a stick
77. Wrong... because they're holding the string
78. Right... because their skipping ropes are on the floor
79. Wrong... because the mum and the baby one are skateboarding
80. Wrong... because the mum and the dad have got hats
81. Wrong... because they they're holding wood
82. Right... because they're not holding string
83. Right... because they haven't got stick
84. Wrong... because they stand on the skateboards
85. Wrong... because they're holding the wood
86. Right... because the baby one and the mummy one is running...not the dad
87. Right... because their skipping ropes are on the floor
88. Right... because their legs are not moving

LA1/23:

- c. No... because all of them are running
4. No... because they haven't
5. No... because they're on the skateboard
6. Yes... because two of them are skating and Bart Simpson's not
7. No... because two of them have got balloons
8. Yes... because they're not on the skateboards...the skateboards are in front of them
9. No... because all of the Simpsons have got balloons
10. No... because the hats are piled up on there
11. No... because they have all got hats
12. No... because they've got balloons in their hands
13. No... because two of them are running and Homer isn't
14. Yes... because they haven't broken legs because they haven't got a walking stick
15. No.. because two of them are skating
16. Wrong... because both of them...two of them have broken legs
17. No... yes because those two have got hats and Bart hasn't
18. Yes... because those two are skipping and Bart isn't
19. Yes... because they're standing still
20. No... because two of them have got broken legs
21. No... because em they they're running
22. No... because all of them have got hats
23. No... because she and him are running but he's not
24. Yes... because both of them have got balloons and he hasn't
25. Yes... because the hats piled up over there
26. No... because those two are skipping and Bart isn't
27. No... because em them two are skipping and he's not
28. No... because they're not running
29. No... because they've all got hats on
30. Don't know... REPEAT...yes...because those two have got...em they've got balloons and
Homer hasn't
31. Yes... they...they em haven't got their skipping ropes
32. No... because none of them have got hats
33. No... because they are running
34. No... because they...them two have got hats
35. No... because they've got skipping ropes and they're skipping

36. No... because they've got their skipping ropes in front of them
37. No... because they've got broken legs
38. Yes... because em they haven't got balloons
39. No... they got a walking stick
40. No... because they've got a walking stick
41. No... because they haven't got balloons
42. Yes... because they've got their skateboards in front of them
43. No... because they're skating
44. Yes... because those two have got broken legs and he hasn't
45. No... 'cause they've got balloons in their hands
46. No... because all of them aren't
47. No... because those two are skating and he's not
48. No... because those two have got hats
49. No... because they are skipping
50. Yes... because...because they haven't got balloons in their hands
51. Yes... 'cause they haven't got a walking stick
52. No... 'cause all of them are skating
53. No... because they are skipping
54. Yes... because he's not and those two are
55. Yes... because they're...they're not skipping because their skipping ropes are in front of them
56. Yes... because they're standing still

LA/24:

- 36 Not true... 'cause they're all running
37. No... none of them have broken legs
38. Yep... all of them are skateboarding
39. True... 'cause he isn't
40. Not true... 'cause he hasn't got them...those two have
41. True... 'cause they aren't
42. Not true... 'cause they've all got them
43. True... none of them are wearing hats
44. Not true... 'cause they're all wearing them

45. Not true... 'cause they're all holding them
46. True... that one isn't
47. True... none of them have
48. True... 'cause he isn't
49. True... those two have
50. True... that one hasn't
51. True... that one isn't and those two are
52. Not true... none of them are
53. True... those two has but he hasn't
54. True... they are all running
55. True... 'cause they are all wearing them
56. True... 'cause he isn't
57. True... 'cause he hasn't
58. True... 'cause they're all on the floor
59. True... 'cause he isn't... 'cause he isn't
60. That one isn't...so true
61. True... 'cause they're all standing still
62. Not true... because they are all wearing them
63. True... because those two have but he hasn't
64. They're all on the floor...so it's true
65. Not true... because they're all on the floor
66. They are all running...so true
67. False... 'cause those two are but he isn't
68. True... 'cause they're all skipping
69. True... 'cause they're all on the floor and they're standing still
70. False... 'cause they've all got them
71. True... 'cause they're all standing still
72. False... 'cause they've all got broken legs
73. False... 'cause they've all got broken legs
74. True... 'cause they're all standing still and they're not holding them
75. True... 'cause they're all standing still
76. False... 'cause they're all riding them
77. False... 'cause those two have but he hasn't
78. False... because they're all holding them

79. True... 'cause they're all on the floor
80. True and false... 'cause those two are but he isn't
81. True and false... 'cause those two have but he hasn't
82. False... 'cause they're all skipping
83. True... 'cause they're... 'cause they're all standing still and they're not holding anything
84. True... 'cause they are... 'cause they... 'cause they haven't got those crutches
85. False... 'cause they're all skateboarding
86. False... 'cause they're all skipping
87. True and false... 'cause those two are but he isn't
88. True... 'cause they're all on the floor
89. True... 'cause they're all standing still

LA1/25:

25. Wrong... 'cause they are running
26. Wrong... 'cause they haven't broke their legs
27. Wrong... 'cause they are skateboarding
28. Right... 'cause not all the Simpsons are skateboarding... 'cause Homer's not doing it
29. Wrong... 'cause Bart and Marge have got a balloon
30. Right... 'cause they're not skateboarding
31. Wrong... 'cause they've all got a balloon
32. Right... 'cause their hats are in that pile there
33. Wrong... 'cause they all got hats
34. Wrong... 'cause they've got all got balloons
35. Wrong... 'cause Marge and Bart are running
36. Right... 'cause they haven't got broken legs
37. Right... 'cause Homer isn't skateboarding
38. Wrong... 'cause Marge and Homer have got broken legs
39. Right... 'cause Bart hasn't got a hat
40. Right... 'cause Bart isn't skipping
41. Right... 'cause they're not running
42. Wrong... 'cause Bar...Homer and Marge have got a broken leg
43. Wrong... 'cause they're all running
44. Wrong... 'cause they've all got hats on
45. Wrong... 'cause Marge and Bart are running

46. Right... 'cause only Marge and Bart have got a balloon
47. Right... because they haven't got hats on
48. Wrong... 'cause Bart isn't skipping
49. Wrong... 'cause Bart isn't skipping
50. Wrong... 'cause all of them are not running
51. Wrong... because they've all got a hat on
52. Wrong... because they only...em Homer hasn't got a balloon
53. Right... 'cause they're not skipping
54. Wrong... because it...they...er all haven't got a hat
55. Wrong... 'cause they're all running
56. Wrong... 'cause only Bart has got not hat on
57. Wrong... 'cause they're all skipping
58. Wrong... because they're all not skating
59. Wrong... because they all have got a broken leg
60. Right... 'cause they haven't got a balloon
61. Wrong... 'cause they've all got a broken leg
62. Wrong... they've all got a broken leg
63. Wrong... because nobody has got a balloon
64. Right... 'cause they're not skateboarding
65. Wrong... 'cause they're all skateboarding
66. Right... 'cause Bart hasn't got a broken leg
67. Wrong... because they've all got a balloon
68. Right... because they're not skipping
69. Wrong... only Homer is not skateboarding
70. Wrong... because only Bart hasn't got a hat
71. Wrong... because they are skipping
72. Right... because they haven't got a balloon
73. Right... 'cause they haven't got a broken leg
74. Wrong... 'cause they're all skateboarding
75. Wrong... because they're all skipping
76. Right... because Homer isn't skipping...er running
77. Right... because they're not skipping
78. Right... because they're not running

LA1/26:

1. No... because they are running
2. No... 'cause they haven't got walking sticks or anything else
3. Yes... 'cause they got skateboards
4. Yes... 'cause there's two more left
5. Yes... 'cause there's two holding them
6. Yes
7. Yes... 'cause they all have balloons
8. Yes... 'cause it's on a pile
9. Yes... 'cause they do have them on
10. Right... they do
11. No... they are
12. No... because they haven't got walking sticks
13. No... they are
14. Yes... 'cause they got two walking sticks
15. Yes... 'cause two of them have
16. Yes... Marge and Homer...not Bart
17. That's right... 'cause they're not running
18. No... they do
19. No... they are
20. Yes... they do
21. No... they are
22. Right... because they got balloons
23. Right... because this is on the pile
24. No... they are...Marge and Homer
25. Yes... they are
26. No... not running
27. Right... they do have hats
28. Yes... two have balloons
29. That's right... 'cause they haven't got hold of the skipping ropes
30. Right... 'cause they haven't got hats on
31. No... they are
32. No... because they've got hats on

33. No... they're skipping
34. No... 'cause they haven't got skateboards
35. No... they all have got them
36. Right... because they haven't got them
37. No... because they...these walking sticks
38. Yes... because they all have walking sticks
39. That's right... because they haven't got balloons
40. Right... because they're not holding on the skateboards
41. No... because they are...they are skateboarding
42. No... 'cause two of them have
43. Right... 'cause they have three balloons
44. Yes... because they are not having any skipping ropes
45. No... because they're skateboarding some of them are
46. No... they got two hats
47. No... because some are...three of them are having skipping ropes
48. True... because they have them
49. True... because... 'cause they haven't got broken legs
50. True... because they all have skateboards
51. Yes... because they have skipping ropes
52. Right... because two of them are running
53. True... 'cause they haven't got any skipping ropes
54. True... because they haven't got any

LA1/27:

1. Wrong... because they all are running
2. Right... 'cause they haven't got broken legs
3. Wrong... because they are
4. Right... because two of them are and one isn't
5. Right... 'cause two have got a balloon and one hasn't
6. Right... 'cause they're just looking at the skateboards
7. Wrong... 'cause they have got um balloons
8. Right... because they're just in a pile
9. Right... they have got them on

10. Wrong... they have
11. Wrong... they both are running two of them are
12. Wrong... they have
13. Wrong... 'cause two of them are skateboarding
14. Wrong... because two of them have got um broken legs
15. Right... because um Homer and Marge have got hats
16. Right... because Bart isn't skipping and two are
17. Right... because um they all aren't um running
18. Right... because two have and hasn't
19. Wrong... because three are running and there's meant to be
20. Wrong... 'cause they have got hats
21. Right... because two are and one isn't
22. Right... because two have and one hasn't
23. Right... because um because it's in a pile
24. Right... because two are skipping and one isn't
25. Wrong... one isn't and two are
26. Wrong... 'cause they aren't
27. Wrong... they both they all have hats
28. Wrong... because um two have got balloons and one hasn't
29. Right... because um they all aren't skipping and they're out on the floor
30. Wrong... because um all of them are on the floor
31. Wrong... both of all of them are running
32. Wrong... two of them have got hats and one of them hasn't
33. Wrong... all of them are skipping
34. Wrong... they both they all aren't skipping
35. Wrong... they have got broken legs
36. Right... 'cause they haven't got balloons
37. All of them has 'cause it's right
38. Wrong... 'cause they they all have broken legs
39. Right... because um they haven't got balloons
40. Right... 'cause they aren't skateboarding
41. Wrong... because they all are skateboarding
42. Right... because um Bart hasn't and the other two have
43. Wrong... because um they all have got balloons

44. Wrong... 'cause they all are skipping
45. Wrong... two are and one isn't
46. Wrong... 'cause um two have got hats and one hasn't
47. Wrong... because er they all are skipping
48. Right... because they all haven't got balloons
49. Right... because they haven't got broken legs
50. Wrong... 'cause they are all skateboarding
51. Wrong... because they all are skipping
52. Right... because they um all aren't skipping but some are
53. Right... because they their skipping ropes are on the floor and they aren't skipping
54. Right... because um they're standing still

LA1/28:

1. Wrong... 'cause they're running
2. Right... 'cause they haven't got crutches
3. Wrong... 'cause they're skateboarding
4. Right... because pa Simpson's not skating
5. Wrong... because pa Simpson hasn't got a balloon
6. Right... 'cause he's not skateboarding
7. Wrong... they've all got balloons
8. Right... 'cause they have got hats on
9. Wrong... 'cause they've all got hats on
10. Wrong... 'cause they've all got balloons
11. Wrong... 'cause them two are running
12. Right... 'cause they haven't got broken legs
13. Wrong... because them two are skateboarding
14. Right... because pa Simpson and mum Simpson has got broken legs
15. Wrong Right... because baby Simpson have got a hat
16. Right... because them two are skipping
17. Right... because they aren't skipping running
18. Wrong... because them two have got broken legs
19. Wrong... they're all running
20. Wrong... they've all got hats
21. Right... because pa Simpson isn't running

22. Right... because that one hasn't got a balloon
23. Right... 'cause they haven't got hats on
24. Wrong... 'cause these two are skipping
25. Wrong... these two are skipping
26. Right... 'cause they're not skipping... running
27. Wrong... 'cause they've all got hats
28. Wrong... 'cause this one hasn't got a balloon
29. Right... 'cause they're not skipping
30. Right... 'cause they haven't got hats on
31. Wrong... 'cause they are all running
32. Wrong... 'cause this one hasn't got a hat
33. Wrong... 'cause they're all skipping
34. Right... 'cause they're not skateboarding
35. Wrong... 'cause they've all got broken legs
36. Right... 'cause they haven't got balloons
37. Wrong... 'cause they've all got broken legs
38. Wrong... 'cause they've all got broken legs
39. Right... 'cause they've all got... they're all... they... they... all of them haven't got balloons
40. Right... 'cause they're not all skateboarding
41. Wrong... 'cause they're all skateboarding
42. Right... because they 'cause that one hasn't got a broken leg
43. Wrong... 'cause they've all got balloons
44. Right... 'cause they're all not skipping
45. Right... 'cause this one's not skateboarding
46. Wrong... 'cause they've all... 'cause they've... that one hasn't got a hat
47. Wrong... 'cause they're all skipping
48. Right... 'cause they all haven't got balloons
49. Right... because they all... they haven't got broken legs
50. Wrong... 'cause they're all skateboarding
51. Wrong... 'cause they're all skipping
52. Right... 'cause this one's not running
53. Right... 'cause they're all not skipping
54. Right... 'cause they're all not skipping... not running

LA1/29:

1. No... because they all are
2. Yes... because they all haven't got broken legs
3. No... because they are and the tape said they're not
4. Yes... because he's not
5. No... because it said none of the Simpsons have balloons so they *****
6. Yes... because they're not skateboarding
7. No... because it said not all the Simpsons has balloons so Bart Simpson might have not had a balloon or that one or that
8. Yes... because it said that all the Simpsons haven't got hats and they haven't got them on
9. Nope... because it said not all the Simpsons have got hats on and they have
10. No... because it said not all the Simpsons have got balloons but they have
11. No... because those two are running
12. Yes... because they haven't
13. No... because it said they all aren't skateboarding and two of them are
14. No... because two of them have
15. Yes... they've not got hats on it said and they've not all got hats
16. Yes... because not all the Simpsons are skipping and it said none of the Simpsons are skipping
17. Yes... because it said none of the Simpsons aren't running and they aren't
18. No... because it said none of the Simpsons have got broken legs and they have
19. No... because it said they're not all running and they are
20. No... because the thing said um that they all haven't got hats and they have
21. No... because it said they're all not running and they are
22. Yes... because they've... because not all the Simpsons has got balloons
23. Yes... because it said that none of the Simpsons have got hats and they haven't
24. No... 'cause not all of them are skipping
25. No... because it said none of the Simpsons are skipping and they aren't... I mean are
26. No... Yes... because it said that none of the Simpsons are running and they're not
27. No... because it said that none of the Simpsons have got hats on and they have
28. Yes... because it said like one of the Simpsons haven't got balloons and they haven't
29. Yes... because they've not and the thing said that its not
30. Yes... because it said that all of the Simpsons haven't got hats on and they haven't

31. No... because it said that none of the Simpsons are running are they are
32. No... because it said that all of the Simpsons haven't got hats and they have
33. No... because it said that none of the Simpsons are skipping and they are skipping
34. Yes... because it said that none of the Simpsons are skateboarding and they are not
35. No... because it said that all of the Simpsons haven't got broken legs and they have
36. Yes... because it said that none of the Simpsons haven't got balloons and they have
37. Yes... No... because it's not right because it said that they haven't got broken legs and they have
38. No... because they have... they have got broken legs
39. Yes... because it said that all of the Simpsons haven't got balloons and they haven't
40. Yes... because it said that none of the Simpsons are skateboarding and they aren't
41. No... because it said that none of the Simpsons are skateboarding and they are
42. Yes... because it said that none of the Simpsons has got broken legs and they haven't
43. No... because it said that none of the Simpsons has got balloons and they have
44. Yes... because it said that none of the Simpsons are skipping and they aren't
45. No... because it said that none of the Simpsons are skateboarding and two of them are
46. No... because it said that all of them haven't got hats and they have
47. No... because it said that all of the Simpsons aren't skipping and they are
48. Yes... because it said that all of the Simpsons haven't got balloons and they haven't
49. Yes... because it said that none of the Simpsons have got broken legs and they haven't
50. Um... No... because it said that none of the Simpsons are skateboarding and they are
51. No... because it said that none of the Simpsons are skipping and they are
52. Yes... because it said that none of the Simpsons are running and one of them aren't
53. Yes... because it said that all of the Simpsons are not skipping and they aren't
54. Yes... because it said that none of the Simpsons are running and they aren't

LA1/30:

1. Yes... 'cause they are running
2. Right... 'cause they haven't got holes in their legs
3. Right... 'cause they are skating
4. Yes... Homer's not skating
5. Yes... 'cause Homer hasn't got a balloon
6. Right... 'cause none of them are on their skateboards
7. Wrong... because they have got balloons

8. Yes... because they haven't got their hats on
9. Yes... because they have got hats on
10. Yes... because they all are holding a balloon
11. Yes... because Homer's not running
12. Yes... because they haven't got holes in their skirts and trousers
13. Yes... Homer's not on the skateboard
14. Yes... because Bart hasn't got a broken leg
15. Yes... 'cause Bart hasn't got a hat on
16. Yes... 'cause Bart's not skipping
17. Yes... 'cause they're not walking or running
18. Yes... 'cause Bart hasn't got a broken leg
19. Wrong... 'cause they are all running
20. Yes... because they all have got hats on
21. Yes... Homer's not running
22. Yes... because Homer hasn't got a balloon
23. Yes... 'cause they haven't got hats on
24. Right... 'cause Bart's not skipping
25. Wrong... 'cause Bart's not skipping
26. Wrong... 'cause they're all standing still
27. Wrong... because they haven't... they have got hats on
28. Right... 'cause Homer's not holding a balloon
29. Right... because they've all got skipping ropes
30. Right... 'cause they haven't got hats on
31. Wrong... 'cause they are all running
32. Wrong... 'cause they all have hats on
33. Wrong... because they are all are skipping
34. Right... 'cause they're not on the skateboards
35. Wrong... 'cause they all have got broken legs
36. Right... 'cause they're not holding the balloons
37. Wrong... 'cause they all have got a um bandage around their leg
38. Wrong... 'cause they all have got broken legs
39. Right... 'cause they're not holding a piece of string
40. Right... 'cause the skateboards aren't moving
41. Wrong... 'cause the skateboards are moving

42. Right... 'cause Bart hasn't got a bandage around his leg
43. Wrong... 'cause they're holding a piece of string
44. Yes... 'cause they're not holding the skipping rope
45. Right... 'cause Homer's skateboard's not moving
46. Wrong... 'cause they all don't
47. Wrong... 'cause everyone's skipping
48. Right... 'cause they're not holding something
49. ... because they don't have stitches
50. Wrong... because all the skateboards are moving
51. Right... no... because all the skipping ropes are moving
52. Right... because Homer's not running
53. Right... because the skipping ropes aren't moving
54. Right...

LA1/31:

1. Wrong... because they are running
2. Wrong... because none of them have got a bandage on their legs
3. Right... because... wrong... because they are all skateboarding
4. Right... because Homer Simpson isn't skateboarding
5. Wrong... because two of the Simpsons have got balloons
6. Right... because they're all standing still
7. Wrong... because they all have balloons
8. Right... because the hats are on a pile
9. Wrong... because they all have hats on
10. Wrong... because they all have balloons
11. Wrong... because two of them are running
12. Wrong... because they have... because none of them have got broken legs
13. Wrong... because two of them are
14. Wrong... two of them have got broken legs
15. Right... because Bart Simpson hasn't got a hat
16. Right... because one of them isn't

17. Right... because none of them are running
18. Wrong... because two of them have
19. Wrong... because they are all running
20. Wrong... because they all have hats
21. Wrong... because two of them are
22. Wrong... because two of them have
23. Right... because al the hats are on a pile
24. Wrong... because two of them are
25. Wrong... because two of them are
26. Wrong... because they are all running
27. Wrong... because they all have hats
28. Wrong... because two of them have
29. Right... because they've put their skipping ropes down
30. Right... because the hats are in a pile
31. Wrong... because they are all running
32. Wrong... because two of them have
33. Wrong... because they are all skipping
34. Right... because they skateboards are in front of them
35. Wrong... because they all do
36. Right... because they don't have any balloons
37. Wrong... because they all do
38. Wrong... because they do all have broken legs
39. Right... because they don't have balloons
40. Right... because they aren't all skateboarding
41. Wrong... because they all are skateboarding
42. Right... because Bart Simpson hasn't got a broken leg
43. Wrong... because they all have balloons
44. Wrong... because... right because they are all skateboarding... skipping
45. Wrong... because two of them are
46. Wrong... because two of them have
47. Wrong... because they are skipping
48. Wrong... because they don't have balloons
49. Wrong... because they don't all have broken legs
50. Wrong... because they are all skateboarding

51. Wrong... because they are all skipping
52. Right... because two of... one of them isn't
53. Right... because their skipping ropes are in front of them
54. Right... because they're not running

LA1/32:

1. No... 'cause they all are running
2. That's true 'cause if they had their broken legs they wouldn't be standing up
3. Wrong... 'cause they're all skateboarding on the skateboards
4. Yes... 'cause the Dad's not on his skateboard
5. Wrong... 'cause these two have got balloons
6. Right... 'cause the skateboards are still and they're not skateboarding
7. Um... Wrong... they've all got balloons
8. Right... because the hats are in a pile there and they're not on them
9. Wrong... 'cause they all have
10. Wrong... they've all got balloons
11. Wrong... 'cause these two then him
12. Right... 'cause if they had broken legs they'd be falling around and dragging their legs
13. Wrong... 'cause these two are skateboarding
14. Wrong... these two have but he hasn't
15. Right... 'cause Bart hasn't got a hat
16. Right... 'cause Bart isn't skipping
17. Right... 'cause none of them are running
18. Right... 'cause Bart hasn't got his broken leg
19. Wrong... 'cause they're all running
20. Wrong... 'cause they've all got hats
21. Right... 'cause he's not running
22. Right... 'cause he hasn't got a balloon
23. Right... they haven't got any hats
24. Right... 'cause Bart isn't skipping
25. Wrong... these two are skipping
26. Wrong... Right... Actually wrong... 'cause none of them are running
27. Wrong... 'cause they've all got hats
28. Wrong... these two have got balloons

29. Right... 'cause all the skipping ropes are on the floor
30. Right... 'cause all the hats are in a pile there
31. Wrong... 'cause they're all... all of them are running
32. Wrong... 'cause these two have
33. Wrong... they're all skipping
34. Right... 'cause none of them are skipping... um skateboarding
35. Wrong... they've all got broken legs
36. Right... 'cause um there's no balloons in their hands
37. Wrong... they all have got broken legs
38. Right... 'cause they all have got broken legs
39. Right... 'cause they haven't got any balloons
40. Right... 'cause they're not skateboarding
41. Wrong... 'cause they all are skateboarding
42. Right... 'cause Bart hasn't
43. Wrong... 'cause there's a balloons there and balloon there and a balloon there
44. Right... 'cause they're not skipping
45. Wrong... 'cause those two are
46. Wrong... these two have
47. Wrong... 'cause they all are skipping
48. Right... 'cause they haven't got balloons
49. Right... they haven't got any broken legs
50. Wrong... they all are skateboarding
51. Wrong... they all are skipping
52. Right... 'cause Bart um homer isn't
53. Right... 'cause they haven't picked up... 'cause all the ropes are on the floor and they're not skipping
54. Right... 'cause they're not running

LA2/33:

1. Yes... 'cause they're all running
2. No... 'cause they haven't got broken legs
3. Yes... 'cause they're skateboarding
4. No... 'cause he's not skateboarding
5. Yes... 'cause these two have got balloons

6. No... 'cause they're not skateboarding
7. Yes... 'cause they've all got balloons
8. No... 'cause they haven't got hats on
9. Yes... 'cause they've got all hats on
10. Yes... 'cause they've got balloons
11. No... because he's not running
12. No... because they haven't got broken legs
13. No... because he isn't skateboarding
14. Yes... 'cause em these two have got broken legs
15. No... 'cause he hasn't got a hat
16. No... 'cause he isn't skipping
17. No... because they haven't got... they're not running
18. No... because he hasn't got broken legs
19. Yes... 'cause all three of them are running
20. Yes... 'cause all three of them have got a hat
21. No... 'cause them two aren't running
22. No... 'cause he hasn't got a balloons
23. No... 'cause all three of them have got hats on
24. No... 'cause Bart he's not skipping
25. No... I mean yes... because he isn't skipping
26. No... because they're not running
27. Yes... because they've all got hats on
28. No... because he hasn't got a hat on... balloons on balloon
29. No... because they're not skipping
30. No... because they haven't got hats on
31. Yes... because they're running
32. No... Yes... I mean Yes... 'cause he hasn't got a hat on
33. Yes... 'cause all three of them are skipping
34. No... because they're not skateboarding
35. Yes... 'cause they've all got broken legs
36. No... because they haven't got balloons
37. Yes... because they've got broken legs
38. Yes... because they've all got broken legs
39. No... because they haven't got any balloons

40. No... because they're not skateboarding
41. Yes... because they're all skateboarding
42. No... 'cause only two of them have got broken legs
43. Yes... 'cause they've all got balloons
44. No... 'cause they're not skipping
45. Yes... 'cause those two are skateboarding
46. No... 'cause he hasn't got a hat
47. Yes... them two are skipping
48. No... 'cause they haven't got balloons
49. No... because they haven't got broken legs
50. Yes... because they're all skateboarding
51. Yes... because they're all skateboarding... skipping
52. Yes... No... because um he isn't running
53. No... because they're not skipping
54. No... because they're not running

LA2/34:

1. Wrong... because they are
2. Right... because they can stand up
3. Right... 'cause they're on skateboards
4. Right... 'cause two of them are on and one of them are off
5. Wrong... two of them have balloons
6. Right... because they're not on skateboards
7. Wrong... because they do have balloons
8. Right... because they're on the floor
9. Wrong... they do have hats on them
10. Wrong... they do have balloons
11. Wrong... two are running
12. Right... they're standing up
13. Wrong... one of them are off and two of them are on
14. Wrong... 'cause he... they're holding onto sticks
15. Right... two of them have hats and one of them doesn't
16. Right... two of them are skipping and one of them isn't
17. Right... 'cause they're standing

18. Wrong... two of them have
19. Wrong... 'cause they're all running
20. Wrong... 'cause they all have hats
21. Wrong... two of them are running
22. Right... 'cause two of them have and one of them hasn't
23. Right... 'cause they're all on the floor
24. Wrong... because two of them are and one of them isn't
25. Wrong... two of them are
26. Right... 'cause they're all standing
27. Wrong... they've all got hats on them
28. Wrong... two of them do
29. Right... their skipping ropes are on the floor
30. Wrong... 'cause none of them have hats
31. Wrong... 'cause they're all running
32. Wrong... 'cause two of them have
33. Wrong... they're all skipping
34. Wrong... none of them are skating
35. Wrong... they all have broken legs
36. Right... 'cause they're not holding balloons
37. Wrong... 'cause they do
38. Wrong... 'cause they do have broken legs
39. Wrong... none of them have balloons
40. Right... 'cause their skateboards are still
41. Wrong... 'cause they are
42. Right... two have and one hasn't
43. Wrong... they all have balloons
44. Wrong... none of them are skipping
45. Wrong... two of them are
46. Wrong... two of them do
47. Wrong... they're all skipping
48. Right... none of them haven't got balloons
49. Right... 'cause they can all stand up
50. Wrong... all of them are skateboarding
51. Wrong... they're all skipping

52. Right... 'cause Homer Simpson isn't
53. Right... the skipping ropes are on the floor
54. Right... 'cause they're standing still

LA2/35:

1. Wrong... because they are running
2. Wrong... because they're all standing up
3. Wrong... because they are
4. Right... two of them are but one of them isn't
5. Wrong... 'cause two of them have
6. Right... because the skateboards are in front of them
7. Wrong... 'cause they've all got balloons
8. Right... they are not wearing them
9. Wrong... because they're all wearing them
10. Wrong... 'cause they've all got a balloon
11. Wrong... two of them but one of them isn't
12. Right... um because they're all standing up
13. Wrong... 'cause one of them isn't two of them are
14. Wrong... because two of them have
15. Right... because two of them have one of them hasn't
16. Right... because one isn't two of them are
17. Right... 'cause they're all standing
18. Right... 'cause two of them hasn't
19. Wrong... 'cause they all have
20. Wrong... 'cause they all have
21. Wrong... 'cause two of them are and one of them isn't
22. Right... 'cause two of them have one of them hasn't
23. Right... 'cause they haven't got them on they've got them in front of them
24. Right... 'cause they've got two there um they've got two skipping one that isn't
25. Wrong... 'cause two of them are one of them isn't
26. Wrong... 'cause they're all standing
27. Wrong... 'cause they've all got one
28. Wrong... 'cause two of them have one of them hasn't

29. Right... they've got them in front of them
30. Wrong... all of them haven't got a balloon
31. Wrong... 'cause they're all running
32. Two of them have one of them hasn't... so it's wrong
33. Wrong... 'cause they all are
34. Wrong... because they're all standing with the skateboards in front
35. Wrong... 'cause they all have
36. Right
37. Wrong... because they have got broken legs
38. Wrong... 'cause they all have got a broken leg
39. Wrong... 'cause they all haven't
40. Right... because they're all in front of them
41. Wrong... because they all are
42. Right... because one of them hasn't
43. Wrong... because they all have got one
44. Wrong... because none of them are skipping
45. Wrong... because two are one isn't
46. Wrong... because two of them has one hasn't
47. Wrong... because they all are
48. Wrong... because they all haven't got a balloon
49. Right... because none of them have
50. Wrong... because they are all skateboarding
51. Wrong... because they all are skipping
52. Right... because two of them are one isn't
53. Right... because all the skipping ropes are in front of them
54. Right... because they're all standing

LA2/36:

1. No... because they're all running
2. No... because they still standing
3. Yes... because um they're not skateboarding
4. Yes... 'cause Homer's not on the skateboards
5. Yes... because Homer hasn't got one
6. Right... because um all of them are not on their skateboard

7. Right... 'cause they've all got balloons
8. Right... because um because they're not wearing hats
9. Right... because they're all wearing hats
10. Wrong... 'cause they all got balloons
11. Yes... 'cause Homer isn't running
12. Yes... 'cause they're standing still
13. Wrong... 'cause Homer isn't on the skateboard
14. Right... 'cause Bart hasn't got... Homer hasn't got a broken leg
15. Yes... 'cause Bart hasn't got one on
16. Right... because um Bart isn't skipping
17. Right... 'cause none of them are running
18. 'cause Bart hasn't got one on
19. Right... 'cause Bart isn't
20. Wrong... 'cause they all got hats
21. Right... 'cause Homer is not running
22. Right... because he hasn't got a balloon
23. Right... 'cause they're not wearing hats
24. Right... 'cause they... 'cause Bart hasn't got a skipping rope
25. No... because Bart hasn't got one
26. Right... 'cause they're not running
27. Wrong... 'cause they're all wearing hats
28. Right... because um Homer hasn't got a balloon
29. Right... because um they haven't got a skipping rope
30. Right... because um they're not wearing hats
31. Right... 'cause Bart isn't running
32. Wrong... because um Bart hasn't got a hat on
33. Wrong... because they're all skipping
34. Right... because um because they're not skateboarding I think
35. Wrong... because um they all got broken legs
36. Right... 'cause they're not holding one
37. Wrong... because they all got broken legs
38. Right... because they all got broken legs
39. Right... because um they are... because they not holding a balloon
40. Right... because um they're not on the skateboards

41. Wrong... because um they're all skateboarding
42. Right... because Bart isn't hasn't got a broken leg
43. Wrong... because um they all holding a balloon
44. Right... because um they haven't got a skipping rope to skip with
45. Right... 'cause Homer is not on the skateboard
46. Right... um Bart hasn't got a hat
47. Wrong... because they're all skipping
48. Right... because um they're not holding them
49. Right... because um because they haven't got a bandage on their legs
50. Wrong... 'cause they're all skateboarding
51. Wrong... well because um... well because they're all skipping
52. Right... because homer is not running
53. Right... because um they're not skipping
54. Right... because um because they're all standing

LA2/37:

1. True... False because they're all running
2. Yes... because none of them have broken their leg
3. No... actually they are all skateboarding 'cause Bart is skateboarding and his parents are skateboarding
4. Right... because because Bart's Dad isn't skateboarding
5. False... because Bart and his mum are holding balloons but his father isn't
6. True... because none of them are skateboarding in the picture
7. False... because they are all having... they have all got a balloon
8. False... because there's three hats and three there... because none are wearing hats in the picture
9. False... because they're all wearing hats
10. False... because um they're all holding balloons in the picture
11. False... one of them isn't running... one of them's standing
12. False... because none of them have got broken legs
13. True... because one of the Simpsons is... Bart's father isn't skateboarding
14. False... because Bart's mum and dad have broken their leg
15. True... because Bart isn't wearing a hat
16. True... because Bart's father and mother are skipping and Bart isn't

17. True... because none of them are running
18. False... because Bart hasn't got a broken leg
19. False... because they are all running
20. False... because they've all got hats on
21. True... because one of the Simpsons aren't running
22. True... Mr Simpson isn't having... hasn't got a balloon
23. True... because none of the Simpsons have got hats on
24. True... because Bart isn't skipping
25. False... because Bart... Bart's mother and father are skipping but Bart isn't skipping
26. True... because none of the are running
27. False... because all of them have hats on
28. True... because Bart's mother and Bart have a balloon but Mr Simpson doesn't have a balloon
29. True... because none of the Simpsons are skipping
30. True... because all the hats are in a pile
31. False... because that... they are all skipping... running
32. True... because Bart hasn't got a hat
33. False... because they are all skipping
34. True... because none of them are skateboarding
35. False... because they've all got broken legs
36. True... because none of them have balloons
37. False... because none because all of them have broken legs
38. False... because because they all have got broken legs
39. True... because none of them have balloons
40. True... because none of them are are not skateboarding
41. False... because all of them are skateboarding
42. True... because Bart doesn't have a broken leg
43. False... because they all have got a balloon
44. True... because none of them are skipping
45. True... Bart's father isn't skateboarding but his mother is and he is
46. True... because Bart hasn't got a hat on
47. False... because they all are skipping
48. True... because none of them have balloons
49. True... because none of them have broken legs

50. False... because they're all skateboarding
51. False... because they're all skipping
52. True... because because um Bart's father isn't running
53. True... because they're because they're all not skipping
54. True... because none of them are running

LA2/38:

1. Wrong... because I can see um because I can see them with their legs moving
2. Wrong... 'cause I can't see any bandages on them
3. Wrong... 'cause I can see them on the skateboards
4. Right... 'cause I can see those two and he's not
5. Wrong... 'cause I can see the lady and the little boy got a balloon
6. Right... because all the skateboards in front of them and they are just standing there
7. Wrong... 'cause I can see them all have a balloon in their hand
8. Right... 'cause they're all piled up on the floor
9. Wrong... because I can see them they've got them on
10. Wrong... because they've all got them in their hands
11. Right... Wrong because some of them are running
12. Right... because they're just standing there and they haven't got any bandages round them
13. Right... because two of them are and one of them aren't
14. Wrong... 'cause the lady and the man have and the little boy hasn't
15. Right... because they've got them on their heads
16. Right... because those two... lady and man are skipping and the boy isn't
17. Right... 'cause they're just standing there
18. Wrong... lady and man have
19. Wrong... because you can see their legs moving
20. Wrong... because they've all got their hats on their head
21. Right... because the man is just standing there and I can see the lady and boy their legs moving
22. Right... because the man isn't holding anything
23. Right... because they're all in a pile
24. Right... because the boy isn't skipping
25. Wrong... 'cause the man and lady are
26. Right... because they're standing on the floor

27. Wrong... because they've got them on their heads
28. Right... because the man hasn't got anything in his hand and the lady and this boy have got a balloon in their hands
29. Right... because all the skipping ropes are on the floor
30. Right... because they're all of them on the floor
31. Wrong... because I can see their legs moving
32. Wrong... because the boy hasn't got his hat on
33. Wrong... because I can see them skipping with their skipping ropes
34. Wrong... because all the skateboards are still on the floor
35. Wrong... because I can see the bandages on their legs
36. Right... 'cause they're just standing
37. Wrong... because I can see the bandages on their legs
38. Wrong... because they've still got the bandages on their legs
39. Wrong... because they haven't got anything in their hands
40. Right... 'cause the skateboards are still on the floor
41. Wrong... because they're on their skateboards
42. Right... because I can see they've got bandages round their legs and the little boy hasn't
43. Wrong... because they've got the balloons in their hands
44. Right... because all the skipping ropes are on the floor
45. Wrong... because the man isn't skateboarding and the lady and little boy are skateboarding
46. Right... because the man and lady have but the little boy hasn't
47. Wrong... because I can see they're all in their hands and they are skipping with them
48. Right... because they haven't got anything at all in their hands
49. Right... because they're just standing there and they haven't got bandages on their legs
50. Wrong... 'cause they're on their skateboards
51. Wrong... because they're holding their skipping ropes and skipping with them
52. Right... because the man isn't and I can see the boy and the lady are
53. Wrong... because they're all on the floor
54. Right... because they're all standing there

LA2/40:

1. Wrong... because they all... they are all running
2. Wrong... none of them have got broken legs

3. Wrong... because they are all skateboarding
4. Right... 'cause Homer's not on the skateboard
5. Wrong... because Bart and Marge have got the balloons... some balloons
6. Right... because they're all off their skateboards
7. Wrong... because they've all got balloons
8. Right... because the hats are in a pile on the floor
9. Wrong... because they're all wearing hats
10. Wrong... because they've all got balloons
11. Wrong... because Bart and Marge are running
12. Right... because none of them have got broken legs
13. Wrong... because Marge and Bart are still skateboarding
14. Wrong... because Marge and Homer have got crutches
15. Right... because Bart isn't wearing a hat
16. Right... 'cause Bart isn't skipping
17. Right... 'cause none of them are running
18. Wrong... because Marge and Homer have got crutches
19. Wrong... 'cause they are all running
20. Wrong... 'cause they all have got hats
21. Wrong... 'cause Marge and Bart are still running
22. Right... 'cause Homer hasn't got a balloon
23. Right... because they're all in a pile on the floor
24. Wrong... because Marge and Homer are skipping
25. Wrong... because Marge and Homer are skipping
26. Wrong... because none of them are running
27. Wrong... because they are all wearing hats
28. Wrong... Bart and Marge have got balloons
29. Right... because the skipping ropes are on the floor
30. Wrong... 'cause none of them have got hats
31. Wrong... 'cause they are all running
32. Wrong... 'cause Marge and Homer have got hats
33. Wrong... 'cause Bart, Homer and Marge are all... they're all skipping
34. Wrong... 'cause none of them are skateboarding
35. Wrong... 'cause they all have got broken legs
36. Right... because Bart, Homer and Marge haven't got any balloons

37. Wrong... because they all have got broken legs
38. Wrong... because they all have got broken legs
39. Wrong... 'cause none of the Simpsons have got balloons
40. Right... because Bart, Homer and Marge aren't on the skateboards
41. Wrong... 'cause they all on skateboards
42. Right... because only Homer and Marge have got broken legs
43. Wrong... because they've all got balloons
44. Wrong... because none of the Simpsons are skipping
45. Wrong... because Marge and Bart are still skateboarding
46. Wrong... because Homer and Marge have still got hats
47. Wrong... 'cause they are all skipping
48. Right... because Bart, Homer and Marge haven't got any balloons
49. Right... because none of them have got crutches
50. Wrong... 'cause they are all on skateboards
51. Wrong... 'cause they've all got skipping ropes
52. Right... 'cause Homer isn't running
53. Right... because none of them are skipping
54. Right... because none of them are running

LA2/41:

1. Wrong... because all the Simpsons are running
2. Wrong... because all the Simpsons haven't got broken legs
3. Wrong... because all the Simpsons are skateboarding
4. Right... because Bart... Homer isn't skating... skateboarding
5. Wrong... because two of the Simpsons have got balloons
6. Right... because none of the Simpsons are skateboarding
7. Wrong... because all of the Simpsons have got balloons
8. Er they do have hats but they're not putting them on right... because all the hats are on the floor
9. Wrong... because all the Simpsons have hats
10. Wrong... 'cause all the Simpsons have got balloons
11. Wrong... because Bart and Marge are running
12. Right... because none of the Simpsons have got broken legs
13. Wrong... because Bart and Marge are skateboarding

14. Wrong... because two of the Simpsons have got broken legs
15. Right... because only two of the Simpsons have got hats on
16. Right... because two... one Simpson is left out and two others are skipping
17. Right... because they're all standing still
18. Wrong... because two Simpsons have broken legs
19. Wrong... because all the Simpsons are running
20. Wrong... because they have got hats on
21. Wrong... because two Simpsons are running
22. Right... because only two have balloons
23. Right... because none of the Simpsons have hats on
24. Wrong... because Bart and Marge... I mean Homer and Marge are skipping but not Bart
25. Wrong... because Homer and Marge are skipping
26. Wrong... because none of the Simpsons are running
27. Wrong... because all the Simpsons have hats on
28. Wrong... because Homer doesn't have a balloon
29. Right... because none of the Simpsons are skipping
30. Right... um I mean wrong... because none of the Simpsons have hats on
31. Wrong... because all the Simpsons are running
32. Wrong... because Homer and Marge have got hats on
33. Wrong... because all the Simpsons are skipping
34. Wrong... because none of the Simpsons are skateboarding
35. Wrong... because all the Simpsons have broken legs
36. Right... because none of the Simpsons do have balloons
37. Wrong... because all the Simpsons have got broken legs
38. Wrong... because they all have broken legs
39. Right... I mean wrong... because none of the Simpsons have balloons
40. Right... because none of the Simpsons aren't skateboarding
41. Wrong... because all the Simpsons are skateboarding
42. Right... because only Bart has not got a broken leg
43. Wrong... because all the Simpsons have got balloons
44. Right... I mean wrong... because all the Simpsons aren't skipping
45. Wrong... because only Homer isn't skateboarding
46. Wrong... because only Homer and Marge have hats on
47. Wrong... because all the Simpsons are skipping

48. Right... because none of the Simpsons have got balloons
49. Right... because none of the Simpsons have got broken legs
50. Wrong... because all the Simpsons are skateboarding
51. Wrong... because all the Simpsons are skating... I mean skateboarding... oh skipping
52. Right... 'cause Homer isn't running
53. Right... because none of the Simpsons are skipping
54. Right... because none of the Simpsons are doing anything

LA2/42:

1. Wrong... because they are all of them running
2. Wrong... because they 'cause their legs aren't broken
3. They are yes... wrong... 'cause they're all on skateboards
4. Right... because not all of them are on skateboards... skateboarding
5. Wrong... 'cause half of the Simpsons have balloons
6. Right... 'cause they aren't skateboarding
7. Wrong... because they all of them have balloons
8. Right... because they 'cause they haven't got hats on
9. Wrong... because they all they all have hats on
10. Wrong... because they all have balloons
11. Wrong... because one's not running
12. Wrong... because they 'cause their legs aren't broken
13. Wrong... 'cause only two skateboarding
14. Wrong... because two of them have got broken legs
15. Right... because two have... only two of them have got hats
16. Right... because only two of them are skipping
17. Right... because they haven't got broken legs
18. Wrong... because only two of them have got broken legs
19. Wrong... 'cause all of the Simpsons are running
20. Wrong... because all of the Simpsons do have hats
21. Wrong... because only two of them are running
22. Right... because only only two of them have balloons
23. Right... because they don't have hats on
24. Wrong... 'cause only two of them are skipping
25. Wrong... because only two of them are skipping

26. Right... because they're not running
27. Wrong... because they all have hats
28. Right... 'cause only two of them have balloons
29. Right... because none of the Simpsons are skipping
30. Wrong... because they don't have hats on
31. Wrong... because all of the Simpsons are running
32. Wrong... because only two of the Simpsons have hats on
33. Wrong... because all of the Simpsons are skipping
34. Wrong... because they're all not skateboarding
35. Wrong... because all of the Simpsons do have broken legs
36. Right... because all of them haven't got balloons
37. Wrong... because they all have broken legs
38. Wrong... because all of the Simpsons do have broken legs
39. Wrong... because they all don't have balloons
40. Right... because they're all not skateboarding
41. Wrong... because all of the Simpsons are skateboarding
42. Right... because only two people have broken legs
43. Wrong... because all of the Simpsons do have balloons
44. Wrong... because all of the Simpsons aren't skipping
45. Wrong... because only two of the Simpsons are skateboarding
46. Wrong... because only two of the Simpsons have hats on
47. Wrong... because all three of the Simpsons are skipping
48. Right... because all of the Simpsons haven't got any balloons
49. Right... because they haven't got any bandages around their legs
50. Wrong... all three of the Simpsons are skateboarding
51. Wrong... 'cause all of the Simpsons are skipping
52. Right... 'cause not all of the Simpsons are skipping... running
53. Right... 'cause all of the Simpsons aren't skipping
54. Right... 'cause none of the Simpsons are running

LA2/44:

1. Wrong... because you can see that they're all running
2. Wrong... because um none of them have got um... I've forgot what they're called
3. Wrong... because um because you can see that they're skating along the floor

4. Right... because um he's not skating and they are skating
5. Wrong... because um they've got a balloon
6. Right...because the skateboards are on the floor
7. Right... because um... right because um they've all got balloons
8. Right... because the hats are on the floor
9. Wrong... 'cause the hats are off the floor and now they're on their heads
10. Wrong... because they've all got balloons
11. Wrong... 'cause they're both running an he isn't
12. Right... because um none of them have got broken legs
13. Wrong... 'cause they're both skating hand he's not
14. Wrong... because those two have got broken legs and he um hasn't
15. Right... 'cause they've got hats and he hasn't
16. Right... 'cause they're skipping and he's not
17. Right... 'cause they're not running
18. Wrong... 'cause they've got broken legs
19. Wrong... 'cause they are running
20. Wrong...because um they've all got hats on
21. Wrong... 'cause he's not running and them two are running
22. Right... they have got balloons and he hasn't
23. Right... because all of the hats are on the floor
24. Wrong... 'cause um he's skipping... no I mean they're skipping and he's not
25. Wrong... 'cause they are both skipping and um he's not
26. Wrong... 'cause none of them are skipping... I mean running
27. Wrong... 'cause all of the Simpsons have got hats on
28. Wrong... because um they have got balloons and he hasn't
29. Right... 'cause the skipping ropes are on the floor
30. 'cause the hats are on the floor... wrong
31. Wrong... because they are running
32. Wrong... because they have got hats and um he has no... I mean they have got hats and he
hasn't
33. Wrong... 'cause all of the Simpsons are skipping
34. Wrong... 'cause none of them are skateboarding
35. Wrong... 'cause um they've all got broken legs
36. Right... 'cause there are no balloons in this picture

37. Wrong... because they have all got broken legs
38. Wrong... 'cause the Simpsons have got broken legs
39. Wrong... because none of them have got balloons
40. Right... because none of them are on skateboards
41. Wrong... 'cause they are skating
42. Right... 'cause he hasn't got a broken leg and they have
43. Wrong... because they have all got balloons
44. Wrong... because no-one is skipping in the picture
45. Wrong... 'cause they are skateboarding and he isn't
46. Wrong... 'cause they've got hats and he hasn't
47. Wrong... 'cause they are skipping
48. Right... because there's no balloons in the picture
49. Right... because none of them have got broken legs
50. Wrong... because they are all skateboarding
51. Wrong... 'cause they're all skipping
52. Right... because he's not skipping and they are... I mean running
53. Right... because none of their legs are moving

LA3/46:

1. Wrong... because none of them are not running
2. Wrong... because none of them have got broken legs
3. Wrong... because they all are skateboarding
4. Right... because Homer's standing
5. Wrong... because them two have... Marge and Bart have got balloons and Homer hasn't
6. Right... 'cause none of them are skateboarding
7. Wrong... 'cause all of them do have balloons
8. Right... 'cause none of them do have hats
9. Wrong... 'cause all of them do have hats
10. Wrong... 'cause all of them do have balloons
11. Wrong... because Marge and Bart are running and Homer's not
12. Right... because um none of them do have broken legs
13. Right... because Homer's not

14. Wrong... because they um Marge and Homer do have broken legs
15. Right... because Bart doesn't have a hat
16. Right... because Marge and Homer are skipping but Bart isn't
17. Right... because none of them are running
18. Wrong... because... oh right because Bart doesn't and the both does... the others do
19. Wrong... because they are all running
20. Wrong... because they all do have hats
21. Right... because Bart isn't and Homer isn't
22. Right... because Homer doesn't
23. Right... because they don't have hats
24. Right... because Bart isn't
25. Right... because Bart isn't
26. Right... because none of them are running
27. Wrong... because they all do have hats
28. Right... because Homer doesn't
29. Right... because none of them are skipping
30. Right... because none of the do have hats
31. Wrong... because they all are running
32. Right... because Bart doesn't
33. Wrong... because they are all skipping
34. Right... because none of them are skateboarding
35. Wrong... because they all do have broken legs
36. Right... because none of them do have balloons
37. Wrong... because they all do have broken legs
38. Wrong... because they all do have broken legs
39. Wrong... because they all do have balloons... right because they don't all have balloons
40. Right... because they all aren't skateboarding
41. Wrong... because all of them are skateboarding
42. Right... because Bart doesn't
43. Wrong... because they all do have balloons
44. Right... because none of them are skipping
45. Wrong... because they all because Homer isn't
46. Wrong... right because Bart doesn't
47. Wrong... because they all are skipping

48. Right... because um... wrong because they all don't have balloons
49. Right... because none of them do have balloons
50. Wrong... because they all are skateboarding
51. Wrong... because they all are skipping
52. Wrong... because they... right because Homer isn't
53. Right... because they all aren't skipping
54. Right... because none of the Simpsons are running

LA3/47:

1. Right... because they're moving
2. Right... because they're all standing up
3. Wrong... because they're on their skateboards
4. Right... 'cause one of them isn't on the skateboard
5. Wrong... because two of them have got balloons
6. Right... because they're not on the skateboards
7. Wrong... because they all have balloons
8. Right... because they're not wearing them
9. Wrong... because they're all wearing hats
10. Wrong... because they all have got balloons
11. Wrong... because two of them are running
12. Right... because they haven't got um... one of things that you round your leg
13. Right... because one of them isn't
14. Wrong... because two of them have got broken legs
15. Right... because one of them hasn't got one
16. Right... because one of them isn't skipping
17. Right... because they're standing still
18. Wrong... because two of them have got broken legs
19. Wrong... because they all are running
20. Wrong... because they all have got hats
21. Wrong... right because one of them isn't running
22. Right... because one of them haven't got a balloon
23. Right... 'cause they're not wearing any hats
24. Wrong... 'cause two are skipping
25. Right... because one of them isn't skipping

26. Right... because they are not running
27. Wrong... because they're wearing hats
28. Wrong... because two of them have got balloons
29. Right... because they haven't got the skipping ropes
30. Right... because they're not wearing any hats
31. Wrong... because they're all running
32. Wrong... because two of them have got hats
33. Wrong... because they're all skipping
34. Right... because none of them are skateboarding
35. Wrong... because all of them have got broken legs
36. Right... because none of them are holding any balloons
37. Wrong... because they've all got broken legs
38. Wrong... because all of them have got broken legs
39. Right... because they're not holding a balloon
40. Right... because they're not on their skateboards
41. Wrong... because all of them are skateboarding
42. Right... because one of them hasn't got a broken leg
43. Wrong... 'cause all of them have got balloons
44. Right... because none of them are skipping
45. Wrong... because two of them are skateboarding
46. Wrong... because two of them have got hats
47. Wrong... because all of them are skipping
48. Right... because they're not holding any balloons
49. Right... because they're all standing up without a crutch
50. Wrong... because they are all skateboarding
51. Wrong... because they all are skipping
52. Right... because one of them isn't running
53. Right... because they haven't got any skipping ropes in their hands
54. Right... because it doesn't look as though they're moving

LA3/48:

1. Wrong... 'cause all of them are
2. Wrong... 'cause none of them have broken legs
3. Wrong... 'cause they are all on skateboards

4. Right... because Homer's not
5. Wrong... two of the Simpsons have balloons
6. Right... 'cause the skateboards are only in front of them
7. Wrong... 'cause they all have balloons
8. Wrong... 'cause there is three in front of them
9. Wrong... 'cause they all have hats
10. Wrong... they all have a balloon
11. Wrong... two of them are running
12. Right... 'cause they are all standing
13. Wrong... two of them are skateboarding
14. Wrong... two of them have broken legs
15. Wrong... two of them have hats
16. Right... because Bart's not skipping
17. Right... because they are all standing
18. Wrong... two of them have brokep legs
19. Wrong... all of them are running
20. Wrong... they all have hats
21. Wrong... two of them are running
22. Right... 'cause one of them doesn't have a balloon
23. Right... 'cause they're not supposed to be there
24. Wrong... two of them are still skipping
25. Wrong... two of them are skipping
26. Wrong... none of them are running
27. Wrong... they all have hats
28. Wrong... two have balloons
29. Right... the skipping ropes are in front of them
30. Wrong... none of them have hats
31. Wrong... all of the Simpsons are running
32. Wrong... two of the Simpsons have hats
33. Wrong... all of the Simpsons are skipping
34. Wrong... none of them are skateboarding
35. Wrong... they all have broken legs
36. Right... because they're all standing
37. Wrong... all of the Simpsons have broken legs

38. Wrong... all of the Simpsons have broken legs
39. Wrong... none of them have balloons
40. Right... because the skateboards are in front of them
41. Wrong... two of them are skateboarding one is falling over
42. Right... only two have broken legs
43. Wrong... all of the Simpsons have balloons
44. Wrong... none of them are skipping
45. Wrong... two of the Simpsons are skateboarding
46. Wrong... two of the Simpsons have hats
47. Wrong... all of the Simpsons are skipping
48. Right... because they're all standing
49. Right... they are all standing
50. Right... they are all skateboarding
51. Wrong... all of the Simpsons are skipping
52. Right... two of the Simpsons are skipping... running
53. Right... all the skipping ropes are in front of them
54. Right... all of the Simpsons are standing

LA3/49:

1. Wrong... um because all of them are running
2. Yes... um because they're all standing up
3. Wrong... 'cause they're all skateboarding
4. Right... because Homer's standing there watching
5. Wrong... because Marge and Bart are holding balloons
6. Right... because they're all standing there watching the skateboards
7. Wrong... 'cause they're all holding balloons
8. Right... because they're all standing there looking at the hats
9. Wrong... 'cause they're wearing hats
10. Wrong... um because they're all holding them
11. Wrong... because Marge and Bart are running
12. Right... because they're all standing up
13. Right... because Homer's standing there watching
14. Wrong... because they have this funny thing on their arm holding them up
15. Right... because Bart is wearing a hat

16. Right... 'cause Bart isn't skipping... he's just watching
17. Right... 'cause none of them are running
18. Wrong... because Marge and Homer have these funny things there
19. Wrong... because they're all running
20. Wrong... because they're all wearing hats
21. Right... because Homer's standing there
22. Right... because Homer hasn't got a balloon
23. Right... because they're all not wearing hats
24. Right... because Bart isn't skipping... he's just standing there watching
25. Wrong... because Bart and no not Bart... Homer and Marge are skipping
26. Right... because they're all not running
27. Wrong... because they're wearing hats
28. Right... because Homer hasn't got a balloon
29. Right... 'cause they're all not skipping
30. Right... 'cause none of them are on
31. Wrong... because they're all running
32. Wrong... 'cause Marge and Homer are wearing hats
33. Wrong... 'cause they're all skipping
34. Right... 'cause they're all not skateboarding
35. Wrong... 'cause they've got broken legs
36. Right... 'cause they don't have balloons
37. Wrong... 'cause they all got broken legs
38. Wrong... 'cause they all got broken legs
39. Right... 'cause they don't have balloons
40. Right... 'cause they all aren't skateboarding
41. Wrong... 'cause they're all skateboarding
42. Right... 'cause Bart hasn't got a broken leg
43. Wrong... because they've got balloons
44. Right... 'cause they all aren't skipping
45. Wrong... because Bart and Marge aren't... are skateboarding
46. Wrong... 'cause Marge and Homer have hats
47. Wrong... they're all skipping
48. Right... 'cause they all don't have balloons
49. Right... 'cause they don't have broken legs

50. Wrong... 'cause they all are skateboarding
51. Wrong... 'cause they're all skipping
52. Right... 'cause Homer isn't skipping... oh skateboarding... oh running
53. Right... 'cause they all aren't skipping
54. Right... because none of them are running

LA3/50:

1. Wrong... because they are running
2. Wrong... 'cause they haven't got broken legs
3. Wrong... 'cause they are skateboarding
4. Right... 'cause one is not skateboarding and one is watching
5. Wrong... because two of them the mother and the kid have got balloons
6. Right... 'cause they're not skateboarding
7. Wrong... 'cause they have all got balloons
8. Right... 'cause they haven't got hats on
9. Wrong... 'cause they've all got hats
10. Wrong... 'cause they've all got Sim... er balloons
11. Wrong... 'cause one's... wrong I think... 'cause two of them are running
12. Wrong... 'cause none of them's got broken legs
13. Wrong... 'cause two are skateboarding
14. Wrong... 'cause two have broke their legs
15. Right... because one hasn't
16. Right... 'cause one isn't skipping
17. Right... because none of them are running
18. Right... 'cause one hasn't got a broken leg
19. Wrong... 'cause they are running
20. Wrong... 'cause they have got hats
21. Right... because one of them is not running
22. It was wrong 'cause not all of them... because two of them... two of them has got balloons
and one of them has not got balloons
23. Right... 'cause they haven't got their hats on
24. Right... 'cause one of them is not skipping... two of them are
25. Wrong... 'cause two are skipping
26. Wrong... 'cause you said that not all but none of them are running

27. Wrong... 'cause they have got hats
28. Right... 'cause one hasn't and two have
29. Right... 'cause none are skipping
30. Right... 'cause they haven't got hats on
31. Wrong... 'cause they are running
32. Wrong... 'cause one have not got hats on and the other two have
33. Right... no wrong... because all of them are
34. Right... no wrong... because they're not skateboarding
35. Wrong... 'cause they have got broken legs
36. Right... 'cause they haven't got balloons
37. Wrong... 'cause they haven't got broken legs
38. Wrong... 'cause they have got broken legs
39. Right... 'cause they haven't got balloons
40. Wrong... 'cause they aren't skateboarding... no right 'cause they aren't skateboarding
41. Wrong... 'cause they aren't... 'cause they are skateboarding
42. Right... 'cause one of them hasn't got broken legs and two have
43. Right... 'cause they have got balloons
44. Wrong... 'cause they're not skipping
45. Wrong... 'cause two are and one isn't
46. Wrong... 'cause two have and one hasn't
47. Wrong... 'cause they all are skipping
48. Right... 'cause they don't have balloons
49. Right... 'cause they haven't got broken legs
50. Wrong... 'cause they are not 'cause they are skateboarding
51. Wrong... 'cause they are skipping
52. Right... 'cause two are and one isn't
53. Right... 'cause they are not skipping
54. Right... 'cause they are not skipping... running

LA3/51:

1. Right... because... wrong because none of them have
2. Wrong... because all of them are
3. Right... because Homer isn't
4. Wrong... because Marge and Bart have\

5. Right... because they're not standing on the boards
6. Wrong... because all of them have
7. Right... because the hats are on the floor
8. Wrong... because all of the Simpsons have hats
9. Wrong... because all of the Simpsons do have balloons
10. Right... because two of them are walking and one is standing
11. Right... because they... none of them have
12. Right... because Homer isn't
13. Wrong... because Marge and Homer do have broken legs
14. Right... because um Bart doesn't
15. Right... because Bart isn't
16. Right... because all of the Simpsons are standing
17. Wrong... because Marge and Homer do
18. Wrong... because all of the Simpsons are
19. Wrong... because Bart, Marge and Homer do have hats
20. Right... because two of them are
21. Right... because one doesn't
22. Right... because they're on the floor
23. Right... because Bart isn't
24. Wrong... because two are
25. Wrong... because all of them are standing
26. Wrong... because all three are wearing hats
27. Right... because two of them have
28. Right... because all the skipping ropes are on the floor
29. Wrong... because all of them don't
30. Wrong... because all of them are
31. Wrong... because two of them have
32. Wrong... because all of them are
33. Wrong... because none of the Simpsons are skateboarding
34. Wrong... because all of them have
35. Right... because all of the Simpsons do have balloons
36. Wrong... because all of the Simpsons do
37. Wrong... because all of them have broken legs
38. Wrong... because none of them do

39. Wrong... because none of them are
40. Wrong... because all of the Simpsons are skateboarding
41. Right... because Bart doesn't have a broken leg
42. Wrong... because all of the Simpsons have balloons
43. Wrong... because none of the Simpsons are skipping
44. Wrong... because Marge and Bart are
45. Right... because Bart doesn't have a hat
46. Wrong... because all the Simpsons are skipping
47. Wrong... because none of the Simpsons have balloons
48. Right... because none of the Simpsons have broken legs
49. Wrong... because all of the Simpsons are
50. Wrong... because all of the Simpsons are skipping
51. Wrong... because none of the Simpsons are
52. Right... because none of the Simpsons are skipping
53. Right... because all of the Simpsons are standing still
54. Not Recorded

LA3/52:

1. Wrong... 'cause they are all running
2. Wrong... because they're all standing
3. Wrong... because they're on the skateboard
4. Right... because one skateboard hasn't got somebody on it
5. Wrong... because two people are holding them
6. Right... 'cause the skateboard... 'cause they're not on skateboards
7. Wrong... everybody's holding a balloon
8. Right... 'cause they're not wearing them
9. Wrong... because every Simpson has a hat
10. Wrong... because everybody's holding a balloon
11. Wrong... because two of them are
12. Right... because they are all standing
13. Wrong... because two of them are
14. Wrong... because two of them have
15. Right... because one of them hasn't
16. Right... because one of them hasn't got them

17. Right... because nobody's moving
18. Wrong... because one of them hasn't
19. Wrong... because they all are
20. Wrong... three of them have
21. Wrong... because two of them have... are
22. Right... because one of them hasn't
23. Right... because... right because they're not wearing them
24. Right... because one of them hasn't got a skipping rope
25. Wrong... because one of them isn't
26. Right... because none of them are
27. Wrong... because all of them are wearing them
28. Wrong... because one of them hasn't got one
29. Right... because their skipping ropes are on the floor
30. Right... because they're not wearing them
31. Wrong... because they all are
32. Wrong... because two of them have
33. Wrong... because all of them are
34. Wrong... because their skateboards are on the floor
35. Wrong... because all of them have
36. Right... because they're not holding them
37. Wrong... because all of them have
38. Wrong... because all of them have
39. Wrong... because all of them haven't
40. Right... because all of their skateboards are on the floor
41. Wrong... because all of them are
42. Right... because one of them hasn't
43. Wrong... because all of them have
44. Wrong... because all of the skipping ropes are on the floor
45. Wrong... because two of them are
46. Wrong... because two of them have
47. Wrong... because all of them are
48. Right... because they're not holding them
49. Right... because none of them have
50. Wrong... because all of them are

51. Wrong... because they all are
52. Right... one of them isn't
53. Right... because their skipping ropes are on the floor
54. Right... because they're all standing

LA3/53:

1. Wrong... 'cause all of the Simpsons are running
2. Wrong... because they're... all the Simpsons are standing up so they can't have had broken legs
3. Wrong... 'cause they are all skateboarding
4. Right... because Homer Simpson is watching and he isn't skateboarding
5. Wrong... because only Marge and Bart have both got balloons
6. Yes... 'cause all the skateboards are on the floor and it looks like the Simpsons are gasping at the... and um they are not allowed to skateboarding or something
7. Wrong... 'cause all of the Simpsons have balloons
8. Right... 'cause all the hats are piled upon the floor and the Simpsons are looking at them eagerly
9. Wrong... because they're all wearing their hats and Marge Simpson's is going to fall of in a minute
10. Wrong... 'cause they all do have balloons
11. Wrong... 'cause Bart and Marge are both running
12. Right... because none of the Simpsons have plaster round their legs
13. Wrong... 'cause Marge and Bart are skateboarding
14. Wrong... 'cause Marge and Homer both have broken legs
15. Right... because Bart Simpson doesn't have a hat
16. Right... because only Homer and Marge are skipping
17. Right... because none of them are running
18. Wrong... 'cause Marge and Homer both have broken legs
19. Wrong... because all of the Simpsons are running
20. Wrong... because Bart, Homer and Marge all have hats
21. Wrong... because Marge and Bart are both running
22. Right... because Homer doesn't have a balloon and Marge and Bart do
23. Right... 'cause the hats are piled up on the floor
24. Right... wrong... because Bart isn't skipping and Homer and Marge are

25. Wrong... because both Homer and Marge are both skipping
26. Wrong... 'cause none of the Simpsons are running
27. Wrong... 'cause they're wearing the hats that were piled up on the floor
28. Wrong... 'cause Marge and Bart both have balloons
29. Right... 'cause the skipping ropes are on the floor and Bart's looking very happy because they're on the floor
30. Wrong... because none of the Simpsons have hats
31. Wrong... because all of the Simpsons are running
32. Wrong... because Marge and Homer both have hats and Bart doesn't
33. Wrong... because all of the Simpsons are skipping
34. Wrong... 'cause none of the Simpsons are skipping
35. Wrong... because all of the Simpsons have broken legs
36. Right... because none of the Simpsons have balloons
37. Wrong... because all of the Simpsons have broken legs
38. Wrong... because all of the Simpsons have broken legs
39. Wrong... because none of the Simpsons have balloons
40. Right... because the skateboards are not going anywhere and they're not standing on them
41. Wrong... because all of the Simpsons are skateboarding
42. Right... Bart doesn't have a broken leg
43. Wrong... because all of the Simpsons have balloons
44. Wrong... because all... none of the Simpsons are skipping
45. Wrong... 'cause Bart and Marge are
46. Wrong... because Marge and Homer have hats
47. Wrong... 'cause all of the Simpsons are skipping
48. Right... because none of the Simpsons have balloons
49. Right... because none of the Simpsons have plaster on their legs
50. Wrong... 'cause all of the Simpsons are skateboarding
51. Wrong... 'cause all of the Simpsons are skipping
52. Right... because Homer isn't running
53. Right... because the skipping ropes are on the floor and Bart's looking very pleased with himself
54. Right... because none of the Simpsons are running

LA3/54:

1. Wrong... because they all are running
2. Wrong... none of them have
3. Wrong... 'cause they're all skateboarding
4. Right... 'cause Homer is and all the rest is
5. Wrong... because Marge and Bart is... Bart have got them
6. Right... 'cause they're all off their skateboards
7. Wrong... 'cause they've all got balloons
8. Right... 'cause they're piled up
9. Wrong... 'cause they've all got hats on
10. Wrong... 'cause they've all got... 'cause they've all got them
11. Wrong... 'cause Marge and Bart are running
12. Wrong... 'cause they all haven't got broken legs
13. Wrong... 'cause Bart and Marge are
14. Wrong... 'cause Homer and Marge have
15. Right... 'cause um Bart hasn't
16. Right... because Bart isn't
17. Right... 'cause they're all just standing there
18. Wrong... 'cause Marge and Homer does
19. Wrong... 'cause they're all running
20. Wrong... 'cause they... um all of them have got hats on
21. Wrong... Bart and Marge are
22. Right... 'cause Homer hasn't got one
23. Right... 'cause they're piled up
24. Wrong... 'cause Marge and Homer are
25. Wrong... 'cause Homer and Marge are skipping
26. Right... 'cause none of them are running
27. Wrong... 'cause all of them have got them
28. Wrong... 'cause Bart and Marge don't... do
29. Right... 'cause they're on the floor
30. Right... 'cause they're stacked up
31. Wrong... 'cause they're all running
32. Wrong... 'cause Homer and Marge have got them
33. Wrong... 'cause they are all skipping

34. Wrong... 'cause none of them are skipping... skateboarding
35. Wrong... 'cause they all have broken legs
36. Right... because they don't have them
37. Wrong... 'cause they've all got broken legs
38. Wrong... 'cause they've all got broken legs
39. Wrong... 'cause none of them have them
40. Right... 'cause they are on the floor
41. Wrong... 'cause all of the Simpsons are skateboarding
42. Wrong... 'cause Bart hasn't
43. Wrong... 'cause all of them got them
44. Wrong... 'cause none of them are
45. Wrong... 'cause Bart and Marge are
46. Wrong... 'cause Marge and Homer do
47. Wrong... 'cause all of them are skipping
48. Right... 'cause none of them have got them
49. Right... 'cause they all haven't got broken legs
50. Wrong... 'cause they're all skateboarding
51. Wrong... 'cause they're all skipping
52. Right... because Homer isn't
53. Right... because they're just left on the floor
54. Not Recorded

LA3/55:

1. Wrong... because they're all running
2. Right... because all of the Simpsons are standing with two legs straight on the ground
3. Wrong... because they're all skateboarding
4. Right... because Homer Simpson is standing
5. Wrong... because two of them have balloons
6. Right... because they are all standing on the ground
7. Wrong... because they all have balloons
8. Right... because they are stacked in front of them
9. Wrong... because none are wearing hats
10. Wrong... because they all have balloons
11. Right... because two are walking and one is standing

12. Right... because they're all standing on two legs on the ground
13. Wrong... because two are and one isn't
14. Wrong... because two has and one hasn't
15. Right... because there is two with hats and one without
16. Right... because two are skipping and one isn't
17. Right... because they are all standing
18. Wrong... because two have broken legs and one hasn't
19. Wrong... because one is and two aren't
20. Wrong... because they all have hats on
21. Right... because two are walking and one's standing
22. Right... because two have balloons and one hasn't
23. Right... because there's three hats sat in front of them
24. Wrong... because two are skipping and the other one's standing
25. Wrong... because two are skipping and the other one's watching them
26. Right... because they're all standing
27. Wrong... because they all have hats on
28. Wrong... because two have balloons and the other's sat... standing without one
29. Right... because all the skipping ropes are tangled in front of them
30. Wrong... because they all don't have hats because the hats are in front of them
31. Wrong... because they're all running
32. Wrong... because two have hats and one hasn't
33. Wrong... because all three of them are skipping
34. Wrong... because they all have their skateboards in front of them
35. Wrong... because they all have broken legs
36. Right... because they don't have balloons
37. Wrong... because they all have broken legs
38. Wrong... because they all have broken legs
39. Wrong... because they don't... they all have balloons... they don't all have balloons
40. Right... because they're standing looking at their skateboards
41. Wrong... because they're all skateboarding
42. Right... because two of them have broken legs and one hasn't
43. Wrong... because they all have balloons
44. Wrong... because they're all not skipping
45. Wrong... because two of them are skateboarding and one isn't

46. Wrong... because two have hats and one hasn't
47. Wrong... because they're all skipping
48. Right... because they're all standing without balloons
49. Yes... right because they are all standing with two feet on the ground
50. Wrong... because they're all skateboarding
51. Wrong... because they're all skipping
52. Right... because two are running and one isn't
53. Right... because they are all looking at their skipping ropes that are in front of them
54. Right... because they're all standing on the ground

LA3/56:

1. No... because they all are running
2. Yes... because ain't got any bandage on
3. No... because they are all on a skateboard
4. Yes... because two are and one is not
5. No... because two have and one haven't
6. Yes... because they're all off their skateboards
7. No... because they all have skate... em balloons
8. They have hats on and... yes because they're not wearing them
9. No... because they're all wearing them
10. No... because em they're all holding the balloons
11. No... because em two are, one's not
12. Yes... because they haven't got any bandages
13. Yes... because one's off
14. No... because two have got broken legs
15. Yes... because two are wearing, one's not
16. Yes... because the two adults are skipping and the child isn't
17. Yes... because they're all standing still
18. Yes... because because one hasn't and have... two has
19. No... because they all are running
20. No... because they all got them on
21. No... because two are
22. No... because two have
23. Yes... because they all got them off

24. No... because them two are, one's not
25. No... because one isn't and two is... and two is
26. No... because they're all standing still
27. No... because they're all wearing them
28. No... because two have got balloons
29. Yes... because their skipping ropes down
30. Yes... because em they've all piled them up
31. No... because they're all running
32. No... because two have got hats
33. No... because they're all skipping
34. No... because they're all off
35. No... because they've all got broken legs
36. Yes... because they are not holding them
37. No... because they've all got bandages on
38. No... because they've all got sticks
39. Yes... because they're not holding them
40. Yes... because they're not on the skateboard
41. No... because they're all on the skateboard
42. Yes... because em the child has got a em bandages on
43. No... because they have all got them in their hands
44. Yes... because they're not all holding them and their putting them on the ground
45. No... because em two are, one's not
46. No... because em two have and one's not
47. No... because their holding them and skipping
48. Yes... because they're not holding them
49. Yes... because em they're not holding them
50. No... because they're all on their skateboards
51. No... because they're all skipping
52. Yes... because em two are, one's not
53. Yes... because they are all on the ground
54. Yes... because they're all standing up... not running

Appendix 2: Transcripts of SLI sentence production.

SLI1

1. Um... that is wrong I think... 'cause um the legs
2. That's that's wrong as well 'cause they would be in a wheelchair or in hospital
3. That's wrong as well 'cause um most of the family except the baby and Lisa aren't on skates but the other three are
4. Right... Homer's not skating
5. Wrong... 'cause um two of them's got balloons except Homer
6. Right... 'cause they're just stood there
7. No that's wrong... um they've all got balloons
8. Right... 'cause they're just looking at the three hats on the floor
9. Wrong... everybody's got hats
10. Wrong... 'cause all of them's got balloons
11. That's true... 'cause only two's running but Homer's not running
12. That's true... 'cause they're not wrapped in plaster
13. True... 'cause Homer's not skating
14. True... 'cause um they've got broken legs
15. True... 'cause Bart's n... haven't... Bart's hasn't got the hat
16. True... 'cause um Bart hasn't got a skipping rope
17. True... they're just stood there
18. Not right... 'cause um they've got broken legs and they've got um the walking sticks
19. Wrong... 'cause all of them are running
20. Wrong... 'cause all of them's got hats
21. Wrong... 'cause only one's not running
22. True... 'cause Homer's missing out
23. True... 'cause they're on the floor
24. Wrong... 'cause two of them are skipping
25. Wrong... 'cause two of them are
26. True... 'cause they're just stood there
27. Wrong... 'cause they've got hats
28. Wrong... 'cause two of them have got balloons
29. True... um because they're not skipping
30. True... 'cause it's on the floor
31. False... 'cause they all running

32. Wrong... 'cause two of them has hats
33. Wrong... 'cause all of them are skipping
34. True... 'cause they aren't skateboarding
35. Wrong... 'cause all of them have got broken legs
36. True... 'cause they're not holding balloons
37. Wrong... 'cause they have got broken legs
38. Wrong... 'cause they've got plaster on their legs... everyone
39. True... 'cause they haven't got balloons
40. True... 'cause they're just looking at them
41. Not right... 'cause they are skating
42. True... Bart hasn't got a broken leg
43. Wrong... 'cause all of them has balloons
44. Wrong... 'cause oh hang on... yes 'cause 'cause they're not skipping
45. Wrong... 'cause two of them are skateboarding
46. Wrong... 'cause two of them has hats
47. Wrong... 'cause all of them are skipping
48. True... 'cause they haven't got balloons in their hands
49. True... 'cause they've not... they haven't got plaster on their leg
50. Wrong... because all of them are skateboarding
51. Wrong... because um they are skipping
52. True... 'cause one isn't running
53. True... 'cause the skipping ropes are on the floor
54. True... 'cause no-one is running

SLI2

1. That one because he's not running
2. Bart because he's not... he hasn't got... because his face... his face is unhappy
3. Yes... Bart Simpson got he hasn't skate... he hasn't got his two legs on the board
4. Yes... because he hasn't got... he's not standing on the skateboard
5. Yes... because he hasn't got one
6. Yes... because they're not standing on them
7. Yes... they have got balloons
8. They haven't got any hats on them
9. Yes... they have got hats
10. Yes... they have got balloons
11. One of them... two of them is running... one isn't running he's just standing
12. No... they haven't got any broken legs
13. One of them aren't skating
14. Yes... two of them has one of them hasn't got broken legs
15. Yes... two have got hats and one hasn't
16. Yes... um two of them are skipping... one of them are... hasn't got skip
17. Yes... they're not running
18. Yes... they are... have got broken legs
19. They are running... yes they are running
20. Yes... they have got hats

21. Em one of them are not running
22. They haven't... one of them hasn't got any balloon
23. No... they haven't got hats
24. Yes... they are skipping
25. Yes... they are skipping
26. They're not... all of them are not running
27. They have got hats... yes they have
28. Yes... they have got balloons
29. Yes... they're not skipping
30. They haven't got any hats
31. All the all them are running
32. Um two have hats and one hasn't got a hat
33. They are all of them are skipping... yes they are
34. No-one is skateboarding
35. Yes... they have got broken legs
36. They haven't got any balloons
37. Yes... they have got broken legs
38. Yes... they have got broken legs
39. They haven't got any balloons
40. They haven't... they are not skateboarding
41. Yes... they skateboarding
42. No... they have got broken legs but one hasn't
43. Yes... they have got balloons
44. No... they aren't skipping
45. Um... two people has and one hasn't so... two people has skating and one hasn't
46. Yes... they have got hats
47. Yes... they all skipping
48. No... they haven't got any balloons
49. No... they haven't got any broken legs
50. Yes... they are skateboarding
51. Yes... they are skipping
52. No... one aren't
53. No... they aren't skipping
54. No... they aren't running

SLI3

1. Wrong... they're all running
2. Wrong... they're standing
3. Right... they are
4. Yes... 'cause Homer isn't on the skateboard
5. Er well two are... yes
6. Right... 'cause they're not on the skareboard
7. Er other way round... other way round... um they have got... they have got
8. Yes... not... they're not on the head
9. Er yes they are... wrong
10. Em wrong... they've all got em on... in their hand

11. Yes that's right... 'cause Homer's standing
12. Yes... 'cause they're standing still
13. Right... 'cause Homer's still off the skateboard
14. Wrong... they've got broken legs... got walking sticks
15. Right... Bart han't got a hat on
16. Right... 'cause Bart han't got a skipping rope
17. Yes... 'cause they're standing
18. Wrong... 'cause Bart's still standing... han't got a walking sticj
19. Wrong... 'cause they're running
20. Wrong... everyone's got hat
21. Right... Homer still standing
22. Right... 'cause Homer han't got balloon
23. Right... 'cause um... han't got hats on
24. Right... 'cause Bart hasn't got skipping rope again
25. Wrong... er Homer er what's it er Marge got skip rope
26. Right... -s standing
27. Er Wrong... 'cause they haven't got hats on their heads
28. Right... 'cause Homer hasn't got a balloon yet
29. Yep... 'cause all the skipping ropes are on the floor
30. Yep... 'cause they're not on their heads
31. Wrong... 'cause they're running
32. Yes... 'cause Bart han't got a hat
33. Wrong... 'cause all of them got ropes
34. Right... 'cause not on the skateboards
35. Wrong... they got all walking stick things
36. Correct... 'cause there's no balloon in
37. Wrong... they got crutches
38. Wrong again... got crutches again
39. Wrong... oh correct... 'cause there's no balloons
40. Correct... 'cause they're not on the skateboards
41. Wrong... they all on the skateboards
42. Wrong... correct... 'cause Bart hasn't got a crutch
43. Wrong... got all balloons
44. Right... because all the ropes on the floor again
45. Wrong... er Homer's standing again
46. Right... Bart han't got a hat
47. Em Wrong... 'cause they all got ropes and skip
48. Correct... 'cause there's not balloons
49. Correct... no no crutches
50. Wrong... 'cause they're on the skateboards
51. Wrong... got ropes again
52. Correct... Homer standing
53. Em correct... they han't got skipping ropes in their hand
54. Correct... em 'cause they're standing

SLI4

1. No... because they're all running
2. No... 'cause none of them are... none of them have got broken legs
3. No... 'cause they all are
4. Yes... because the dad's not
5. No... 'cause one haven't
6. True... because none of them are actually on the skateboards
7. No... because all of them have got balloons
8. Yes... because the hats are on the floor
9. No... 'cause they've all got hats on
10. No... 'cause they've all got balloons
11. No... because mum and little one is running
12. No... because none of them have actually got any
13. No... because two are
14. No... because two got broken legs
15. True... 'cause the little one hasn't got a hat on
16. True... the little one's not skipping
17. True... because none of them are
18. No... because two have
19. No... 'cause all of them are running
20. No... 'cause they've all got hats on
21. True... because dad's standing still
22. True... none of them have got a balloon
23. True... the hats are in a pile on the floor
24. No... because mum and dad are skipping
25. No... the mum and dad are skipping
26. True... they're all stood still
27. No... they've all got hats on
28. True... 'cause dad han't got a balloon
29. True... 'cause all the skipping ropes are on the floor
30. True... the hats are on the floor
31. No... because they're all running
32. Yes... mum and dad have got hat
33. No... 'cause they're all skipping
34. Yes... 'cause the skateboards are on the floor
35. No... they've all got crutches
36. Yes... there are balloons in the picture
37. Yes... they've all got broken legs
38. No... they've all got broken legs
39. Yes... there's no balloons in the picture
40. Yes... not on their skateboards
41. No... 'cause they're all on their skateboards
42. Yes... 'cause the little one hasn't got a broken leg
43. No... there's all balloons in the picture
44. Yes... because all the skipping ropes are on the floor

45. No... because mum and brother's on the skateboard
46. No... because mum and dad got a hat on
47. No... because they all skipping
48. Yes... because no balloons in the picture
49. Yes... that's true... no broken legs
50. No... because they're all skate
51. No... they they all skipping
52. True... dad's not running
53. True... they're not skipping
54. True... none of them are running

SLI5

1. Yes... they are running... right
2. No... 'cause they only standing up
3. Yes... they are skateboarding
4. No all of them... just two
5. Yes... but two of them got them
6. False... because they're not on it
7. False... because they've got the balloons with them
8. True... because they're just looking at them
9. False... because they got it on
10. False... because um they got it with them
11. Only two of them running... true but only two of them
12. False... because they're standing up
13. False... because um them two are are on skateboard
14. True... because there's only two of them
15. False... 'cause there's only one who's not wearing it
16. Only one is not skipping is true
17. True... because they're just standing
18. False... 'cause er two of them's got broken legs
19. False... 'cause they are running
20. False... 'cause they're wearing it
21. One is not running... true but one is not running
22. True... because there's only one not got their balloon
23. No... because they're looking at them
24. No... because they're 's only two of them skipping
25. Yes... but only one not skipping
26. No... because they're standing up
27. False... because they wearing it
28. True... because there's only one hasn't got a balloon
29. True... because the skipping ropes on the floor
30. 'Cause they're not wearing it... no
31. False... because they are running
32. True... because there's only one not wearing it

33. False... because they are all skipping
34. True... because they're not on it
35. False... 'cause they er got a broken leg
36. True... 'cause they haven't got it with them
37. False... 'cause em they got broken legs
38. False... 'cause they still got a broken leg
39. True... because they don't have it with them
40. True... because they not on it
41. False... because they're on it
42. Yes... because there's only one hasn't got a broken leg
43. False... because they got it with them
44. False... because em... that's true is that OK?... true because it's on the floor
45. True... but only one is not skating
46. True... because there's only one who's not wearing a hat
47. False... 'cause they are skipping
48. True... because they haven't got the balloons with them
49. True... because they are standing up
50. False... because they are on the skateboard
51. False... because they are skipping
52. True... because there's only one not skipping
53. True... because it's on the floor
54. True... because they're only standing up

SLI6

1. True... because all the Simpsons are running
2. False... because they haven't got broken legs
3. False... they are... they are skateboarding
4. True... 'cause Homer doesn't want to skateboard
5. False... 'cause Bart and Marge got balloon
6. True... 'cause they're not riding on the skateboards
7. False... 'cause they have got balloons
8. True... because the don't um wear any hats
9. False... 'cause they are wearing hats
10. False... 'cause they have got balloons
11. True... because Homer is not running
12. True... 'cause they han't got broken legs
13. False... because Marge and Bart are on skateboards
14. True... 'cause Bart haven't got a broken leg
15. True... because Bart haven't got a hat
16. True... because Bart han't
17. True... because they aren't running
18. True... 'cause Bart haven't got a broken leg
19. False... 'cause Simpsons are running
20. False... 'cause they are wearing hats
21. True... because Homer isn't running

22. True... because Homer hasn't got a balloon
23. True... 'cause they looking at the hats
24. False... 'cause Homer and Marge are skipping
25. True... 'cause Bart isn't skipping
26. True... 'cause they standing
27. False... 'cause they are wearing hats
28. True... 'cause Homer hasn't got a balloon
29. True... 'cause they aren't skipping
30. True... 'cause they're not wearing any hats
31. False... 'cause all the Simpsons are running
32. True... 'cause Bart haven't got a hat
33. False... 'cause they are all skipping
34. True... 'cause the they aren't skateboarding
35. False... because they have got broken legs
36. True... 'cause the han't got any balloons
37. False... because they have got broken legs
38. False... 'cause they got bad legs
39. True... 'cause they han't got any balloons
40. True... because they aren't skateboarding
41. True... 'cause Homer's nearly felling off
42. True... 'cause Bart han't got broken leg
43. False... they have got balloons
44. True... 'cause they are looking at the skipping ropes
45. True... because Homer isn't skateboarding
46. True... because Bart haven't got a hat
47. False... 'cause they are skipping
48. True... because haven't got any balloons
49. True... 'cause because the han't got broken legs
50. True... 'cause Homer's frightened on the skateboard
51. False... 'cause they are all skipping
52. True... because Homer's standing
53. True... 'cause they aren't skipping
54. True... 'cause they standing

SLI7

1. No... 'cause they are running
2. No... 'cause they don't have broken legs... they've got... they're not broken
3. Um no that's not right 'cause they are skateboarding
4. Right... 'cause he's not skateboarding
5. Yes... 'cause he doesn't have a balloon... only those two do
6. Yes... because they're not skateboarding 'cause I can't see them moving
7. No... 'cause they do have balloons
8. No... 'cause they hats is on top of each other
9. No... they do have hats
10. No... 'cause they do have balloons

11. No... 'cause one of them's not running... only two of them are... one of them's not
12. No... that's not right 'cause they don't have broken legs
13. No... 'cause two are skateboarding but one is not
14. No... not right... two of them has got broken legs and one of them hasn't
15. Two of them has and one of them hasn't... and it's no
16. No it's not right 'cause two of them are skipping and one of them's not
17. Right... 'cause they not running
18. No not right... 'cause they... one... two of them has and one of them hasn't so
19. No it's not right 'cause they running
20. No it's not right 'cause they do have hats on
21. No it's not right 'cause two of them are running and one of them not
22. No... 'cause two of them has and one of them hasn't
23. No... 'cause the hats is on top of each other
24. No... because one of them not skipping two of them are
25. One of them isn't and two of them are... but it's no
26. Yes... 'cause they're not running
27. Not true no 'cause they do have hats
28. No... 'cause two of them has balloons and one of them hasn't
29. Yes... they're not skipping
30. Yes... the hats are in a pile
31. No not right 'cause they running
32. No not right 'cause two of them have got hats and one of them hasn't
33. No not right 'cause they are skipping... all three of them
34. Yes right 'cause they're not skateboarding
35. They do have broken legs... yes
36. Yes that's right... none of them have balloons
37. They do have broken legs... right
38. No not right 'cause they do have broken legs
39. No not right 'cause they do have balloons
40. No... they're not skateboarding
41. No... 'cause they are skateboarding
42. No... 'cause there's two of them has got broken legs and one of them hasn't
43. No... because they do have balloons
44. No... 'cause they're not skipping
45. No... 'cause two of them are skateboarding and one of them isn't
46. No... 'cause two of them has hats on and one of them hasn't
47. No... 'cause they are skipping
48. Yes... 'cause they don't have balloons
49. No... because they don't have broken legs
50. No... 'cause they are skateboarding
51. No... 'cause they are skipping
52. No... 'cause two of them are running and one of them isn't
53. Yes... 'cause they're not skipping
54. Yes... 'cause they're not running

SLI8

1. They are all running... it's wrong
2. No... because none of those have broken legs
3. That's wrong... because they are all um skateboarding
4. Wrong... because there's only one isn't and all the other ones are
5. Wrong... there is two of the Simpsons do and the other one doesn't
6. Right... because there are... there aren't any of the people... the Simpsons skateboarding
7. Wrong... because they all do have balloons
8. Right... because there's a pile of hats and they don't wear... they haven't wear worn them
9. Wrong... because they do have hats
10. Wrong... because they do all have a balloon
11. Wrong... because there's two is running and one isn't
12. Right... because they don't have a broken leg
13. Wrong... because there's one isn't skateboarding and the other two is
14. Wrong... because there's two has broken legs and the other one doesn't
15. Wrong... because there's two have hats and one doesn't
16. Wrong... because um two is skipping and one isn't
17. Right... because they are not running
18. Wrong... because there's two have broken leg and the other one doesn't
19. Wrong... because they are running
20. Wrong... because they all do have um hats
21. Wrong... because there's two is running and the other one isn't
22. Wrong... because there... two has a balloon and the other one doesn't
23. Right... because they don't have any hats on
24. Wrong... because there's two is skipping and one isn't
25. Wrong... because there is two is skipping and the other one isn't
26. Right... because none of those are running
27. Wrong... because they all do have hats
28. Wrong... because there is two does have a balloon and the other one doesn't
29. Right... because none of those are skipping
30. Right... because they don't have any hats on
31. Wrong... because they all are running
32. Wrong... because two is wearing a hat and one isn't
33. Wrong... because they all are skipping and they are skipping
34. Right... because they are not skateboarding
35. Wrong... because they do have a sk... a broken leg
36. Right... because they haven't got any balloons
37. Wrong... because they do have broken legs
38. Wrong... because they do have broken legs
39. Right... because they don't have any balloons
40. Right... because they aren't skateboarding
41. Wrong... because they are skateboarding
42. Wrong... because there is two has got broken legs and the other one doesn't

43. Wrong... because they all do have balloons
44. Right... because they're not skipping
45. Wrong... because two is skateboarding and the other one isn't
46. Wrong... because there is two has and the other one doesn't
47. Wrong... because they all are skipping
48. Right... because they don't have any balloons
49. Right... because they don't have any broken legs
50. Wrong... because they are skateboarding
51. Wrong... because they are all skipping
52. Wrong... because there is two is running and the other one isn't
53. Right... because they're not skipping
54. Right... because they're not running

SLI9

1. No... because they are running
2. They don't have broken legs... yes that's right
3. No... 'cause they are skating
4. Right... 'cause those two are and he's not
5. No that's not right... 'cause those two have got balloons and he hasn't
6. Yes... 'cause they not... they're just standing there
7. No... because they do have balloons
8. Right... because the ball... the hats are just sitting there
9. Wong... 'cause they're wearing the hats
10. No that's wrong... 'cause they do have balloons
11. None of them?... er that's wrong 'cause two of them are running but only one is not
12. Right... they don't have any broken legs
13. They're skating but he's not so it's wrong
14. Wrong... because those two are er having broken legs but he hasn't
15. Right... because e hasn't but those two have
16. Wrong... 'cause they are skipping but he's not
17. Right... 'cause they not running
18. Wrong... 'cause those two have got broken legs but he hasn't
19. Right... 'cause they are running
20. Wrong... 'cause they do all have hats on
21. Wrong... because two of them are running but one of them's not
22. Wrong... because two of them have got balloons but he hasn't
23. Right... 'cause er three hat are on the floor
24. Wrong... 'cause they're two of them are skipping and he's not
25. Wrong... 'cause two of them are skipping and he's not
26. Right... 'cause they're just standing there
27. Wrong... 'cause they do have hats on
28. Wrong... 'cause they do have balloons
29. Right... 'cause they're just looking at the skipping ropes on the floor
30. Wrong... 'cause they just standing there and the three hats on the floor
31. Wrong... 'cause they are running

32. Wrong... er those two have hats on but he hasn't
33. They're all skipping... that's right
34. Right... 'cause they're just standing there watching the... looking at the skateboards on the floor
35. Wrong... 'cause they do all have broken legs
36. Right... 'cause they don't have balloons
37. Wrong... 'cause they do have broken legs
38. Wrong... 'cause they do all have broken legs
39. They don't have any balloons 'cause they're just standing there... no balloons
40. Right... because er the skateboards are on the floor and they just standing there
41. Wrong... because they are skating
42. Wrong... one of them don't
43. Wrong... 'cause they do all have balloons
44. Right... because they're just standing there watching the skipping ropes on the floor
45. Wrong... because one of them just standing there
46. Er two of them do have hats but one of them don't... er wrong
47. Wrong... 'cause they are all skipping
48. Wrong... 'cause they don't have balloons... they're just standing there
49. Right... 'cause they don't have any broken leg
50. Wrong... 'cause they are skating
51. Wrong... 'cause they are skipping
52. Wrong... 'cause two of them are skipping and one of them are not
53. Right... because they're just standing there looking at the skipping ropes on the floor
54. Right... because they're just standing there

SLI10

1. No... 'cause they all are running
2. Yes... 'cause they're standing
3. No... 'cause they are all
4. Yes... 'cause that one still standing there
5. No... because... yes that's right 'cause there's one person not even having a balloon
6. Yes... because they're just standing there
7. No... 'cause they all do have balloons
8. It depends doesn't it because there's hats there... yes
9. No... because they are wearing hats
10. Not right... well three of them are
11. Not right 'cause... did they say none of them?... there's two of them running
12. No... 'cause none of them do have broken legs
13. Yes... 'cause there's one standing
14. No... because there's two Simpsons have broken their legs
15. Yes... there's there's two Simpsons with hats

16. Yes... 'cause there's um it depends what you're on about 'cause them two skipping ... does it have to be all the Simpsons have to do the same thing?... yes
17. Yes... because they're standing there
18. No... because they both have broken legs
19. Yes... oh not it's not because they are running
20. Yes... they're wearing them
21. No... one is standing
22. Yes... that's correct
23. Yes... 'cause they're not wearing them
24. Yes... 'cause there's one standing there
25. No... 'cause there's two skipping
26. No... 'cause they're all standing
27. Yes... all of them have hats
28. No... yes... 'cause there's one just standing
29. Correct... 'cause they're all just standing there looking
30. Yes... 'cause all the hats are not actually in... quite near them
31. That's not true 'cause they are running
32. No... because there's two people with hats
33. Not true... 'cause they are skipping they're all skipping
34. No-one is skateboarding because they are all just standing there looking at them
35. Not true... 'cause they all got crutches
36. No... because they all just standing there with no balloons in their hands
37. No... all of them have
38. Not true... 'cause they have
39. Not true... because they haven't got no balloons at all
40. Yes... 'cause they're all just standing there looking at them
41. No... 'cause they're just all ska skating
42. There's two of them who have broken legs
43. Yes... they've all got balloons
44. No... 'cause they're all looking down at them
45. Yes... there's two people skateboarding and there's one standing
46. No... not all of them because both of them are wearing hats
47. They are skipping... yes
48. Yes that's correct 'cause they're all just like mucking around
49. Yes that's correct 'cause they're all just standing there
50. Yes... no they are all skateboarding
51. Yes... no sorry um all three of them are skipping
52. Yes it is... one's standing and two running
53. There's three just looking down
54. True 'cause they all just standing there

SLI11

1. No... 'cause all the Simpsons are running
2. No... all the Simpsons not broken legs
3. All... no... all the Simpsons are skateboarding

4. Yes... one person not skateboarding
5. No... um 'cause two people got balloons and one of them not
6. Yes... 'cause them always... them look at the skateboard
7. No... all the Simpsons have balloons
8. Yes... 'cause the Simpsons have got hats
9. No... all the Simpsons have hats
10. No... all the Simpsons have hat... balloons
11. No... two of them are running and one of them not
12. Yes... 'cause the Simpsons not not got broken legs
13. Yes... 'cause two people skateboarding and one person not
14. No... one of the Simpsons got not broken leg
15. Yes... two of them have hats and one not
16. Yes... two um are skipping and one of them aren't
17. No... all of them not running
18. Yes... two of them got broken legs
19. No... all of them running
20. No... the Simpson have hats
21. No... two of them are running
22. Yes... two of them are got balloons
23. Yes... Simpson look at hats
24. Yes... Simpson no two Simpsons are skipping
25. No... one not skipping
26. Yes... all of them not running
27. No... all of them have hats
28. Yes... two of them have balloons
29. Yes... only look at skipping ropes
30. No... all of them the Simpsons look at hats
31. No... all of them are running
32. No... two of them have hat
33. No... all of them are running... skipping
34. No... Simpson aren't skipping
35. No... all of them have broken legs
36. Yes... them haven't have balloons
37. No... all of them have broken legs
38. All of them have broken legs
39. No... them haven't got balloons
40. No... them aren't skateboarding
41. No... all of them skateboarding
42. Yes... two of them have broken legs
43. No... all them have balloons
44. No... none of them are skipping
45. No... two of them are skateboarding
46. No... two of them have hats
47. No... all the Simpson are skipping
48. No... all them haven't got balloons
49. Yes... them haven't got broken legs

50. No... all of them got skateboarding
51. No... all of them are skipping
52. No... two of them are running
53. Yes... all of them look at skate... skipping
54. Yes... them not running

SLI12

1. No... they're all running
2. No... they er look fine
3. No... they are skateboarding
4. That's right because Homer's not on the skateboard
5. Wrong... because of them's... two of them have got balloons... one hasn't
6. Right... because they're not on it... one the skateboards
7. Wrong... because they all got balloons
8. Right... that hats on a pile
9. Wrong... they got the hats on this time
10. Wrong... it's got... they got balloons
11. Wrong... two of them are running and one is stand standing up
12. No... they just look fine again
13. Wrong... two of them are on skateboards... one isn't
14. Wrong... two of them have got broken legs... one hasn't
15. Right... 'cause Bart hasn't got a hat
16. Right... because Bart hasn't got a skipping rope
17. Right... because they're just standing there
18. Wrong... because both of them have got... well two of them have got broken legs
one hasn't
19. Wrong... because they are all running
20. Wrong... because they've got hats
21. Right... because Homer's sitting still
22. Right... Homer doesn't have a balloon
23. Right... because the hats on a pile again
24. No... two of them are skipping... Bart isn't
25. Wrong... both of them are skipping and Bart isn't
26. Right... because they're just standing there
27. Wrong... because they've got hats on
28. Wrong... two of them have got balloons and one hasn't
29. Right... 'cause they're just standing there
30. Right... that hats are on a pile... they're just looking at it
31. Wrong... they all running
32. Wrong... because Homer and Marge don't... have got hats and Bart hasn't
33. Wrong... they all skipping together
34. Wrong... 'cause they're all not doing it... not skateboarding
35. Wrong... because they all got broken legs
36. Right... because they just standing there
37. Right... because they just... they got broken legs

38. Wrong... because they all got broken legs
39. Wrong... because all of them have lost their balloons
40. Wrong... because em they not on the skateboard
41. Wrong... because they are on skateboarding
42. Right... because Bart hasn't broke his leg
43. Wrong... because they all got balloons
44. Wrong... because they all not skipping
45. Wrong... Homer and... sorry Bart and Marge are skating boarding... Homer isn't
46. Wrong... because Bart don't have a hat and the other two have
47. That's wrong... because they got all... they are skipping
48. Right... because they just standing there
49. Right... because they just standing there looking at each other
50. Wrong... because they all skateboarding together
51. Wrong... because they are skipping together
52. Right... because Homer's just standing there
53. Correct... because they're just standing there looking at the skipping ropes
54. Right... they're just standing there

SLI13

1. Yes... they are running
2. They wouldn't be standing up if they had broken legs
3. Yes... they are skateboarding
4. True... because one... the gentleman is not on a skateboard
5. That is true because the young gentleman hasn't got a balloon
6. That's true 'cause they're not on skateboards
7. True... they have all balloons
8. They do have all hats but they are not wearing them
9. Yes that's true... they do all have hats
10. True... that's false... they do all have balloons
11. That's false because one of them aren't running
12. True... because they're standing up
13. True... one of them ain't
14. False... 'cause two of them have
15. That's true 'cause one of them haven't
16. That is true... one of them ain't
17. True... they are not running
18. That is true... not all of them have... only two of them have broken legs
19. That is false... 'cause they all are running
20. That is false... they all have hats
21. That is true... one of them ain't running
22. That is true... one of them haven't... hasn't got balloon
23. That is true... because they aren't... they have got the hats but they're not wearing them
24. That is true... one of them ain't skipping

25. That is false... two of them are skipping
26. That is false... none of them are running
27. That is false 'cause they all have hats
28. That is true... all of them do not have balloons
29. That is true... they are not skipping
30. That is true... they have not all of them have not got hats
31. False... they are all running
32. False... that is true... all of them do not have hats
33. False... they are all skipping
34. That is true... all of them aren't skipping
35. That is false... all of them have broken legs
36. That is true... none of them have balloons
37. That is false... all of them do have broken legs
38. That is true... that's f... that's true yes... they all have broken legs
39. That is true... none of them do have balloons
40. That is true... not all of them are skateboarding
41. False... all of them are skateboarding
42. True... not all of them have sk... broken legs
43. That is false... all of them do have balloons
44. That is true... none of them skipping
45. That is false... two of them are skateboarding
46. That is true... all of them do not h... one of them does not have hat
47. That is false... 'cause they are skipping
48. That is true... all of them do have balloons
49. That is true... none of them do have broken legs
50. That is true 'cause they are skateboarding
51. That is false 'cause they are skipping
52. That is true... one of them ain't skipping... I mean running
53. That is true... all of them are... ain't skipping
54. That is true... none of them are running

SLI14

1. No... they are running
2. No... because they're just standing
3. No... they are skateboarding
4. Yes... because one not on the skateboard
5. No... two of them have balloons... one hasn't
6. Yes... they're just standing there
7. No... they've all got balloons
8. No... the hats are on the floor
9. No... they're wearing them
10. No... they have got balloons
11. No... because there's two is running and one isn't
12. Yes... because they not got broken legs

13. No... because one's not standing
14. No... two of them has and one hasn't
15. Yes... one of them haven't
16. Yes... Bart hasn't got a skipping rope
17. Yes... because they aren't
18. Yes... because Bart doesn't
19. No... 'cause they all running
20. No... because they've got hats
21. No... because two of them are
22. Yes... one doesn't have a balloon
23. Yes... they're not wearing them
24. Yes... because Bart isn't
25. No... two is skipping and the other one isn't
26. No... none of them are
27. No... 'cause they've got hats
28. Yes... 'cause one hasn't
29. Yes... they're not skipping
30. Yes... because they not got hats
31. No... because they're all running
32. No... because two have got hats on
33. No... they all skipping
34. Yes... because all of them isn't skipping
35. No... 'cause they all have
36. Yes... they're not holding balloons
37. No... because they have got broken legs
38. No... because they all have got broken legs
39. Yes... because they haven't got balloons
40. Yes... because they're not on them
41. No... because they on the skateboards
42. Yes... because Bart haven't
43. No... 'cause all of them have
44. Yes... 'cause they're not skipping
45. No... two is skateboarding and the other one isn't
46. No... two has and the other one hasn't
47. No... 'cause they are
48. Yes... 'cause they hasn't got them
49. Yes... they haven't
50. No... because they are skateboarding
51. No... because they are all skipping
52. Yes... because one of them aren't skipping
53. Yes... because they not skipping
54. Yes... 'cause they aren't

Appendix 3: Transcripts of LA question formation

LA1/21

1. What doesn't the stork have?

2. What isn't the knight doing?
3. What doesn't the man have?
4. What isn't the man doing?
5. What doesn't the mouse have?
6. What isn't the stork doing?
7. What isn't the mouse doing?
8. What hasn't the clown got?
9. What hasn't the knight got?
10. What isn't the clown doing?
11. What isn't the duck doing?
12. What hasn't the duck got?

LA1/22

1. What hasn't the stork got?
2. What isn't the knight doing?
3. What hasn't the man got?
4. What isn't the man doing?
5. What hasn't the mouse got?
6. What isn't the stork doing?
7. What isn't the mouse doing?
8. What hasn't the clown got?
9. What hasn't the knight got?
10. What isn't the clown doing?
11. What isn't the duck doing?
12. What hasn't the duck got?

LA1/23

1. What doesn't he have?
2. What isn't he doing?
3. What doesn't he have?
4. What isn't he doing?
5. What doesn't he have?
6. What isn't he doing?
7. What isn't he doing?
8. What doesn't he have?
9. What doesn't he have?
10. What isn't he doing?
11. What isn't he doing?
12. What hasn't he got?

LA1/24

1. What hasn't he got?
2. What isn't he doing?
3. What hasn't he got?
4. What isn't he doing?

5. What hasn't he got?
6. What isn't he doing?
7. What isn't he doing?
8. What hasn't he got?
9. What hasn't he got?
10. What isn't he doing?
11. What isn't he doing?
12. What hasn't he got?

LA1/25

1. What doesn't it have?
2. Why isn't the knight doing anything?
3. Why does it have nothing?
4. What isn't he doing?
5. What doesn't it have?
6. What isn't he doing?
7. What isn't he doing?
8. What hasn't the clown got?
9. What hasn't the knight got?
10. What isn't the clown doing?
11. What isn't the duck doing?
12. What hasn't the duck got?

LA1/26 – EXCLUDED

1. What has the... what has the stork hasn't got?
2. What has the knight not doing something?
3. What the the little man hasn't got?
4. What is he not doing?
5. What is the mouse hasn't got something?
6. What is the stork not doing?
7. What the mouse is not doing something?
8. What has the clown hasn't got something?
9. What has the knight hasn't got something?
10. What isn't the clown not doing?
11. What is the duck not doing?
12. What has the duck not got?

LA1/27

1. What hasn't the stork got?
2. What isn't the knight doing?
3. What hasn't the knight man got?
4. What isn't the knight man doing?
5. What hasn't the mouse got?
6. What isn't the stork doing?
7. What isn't the mouse doing?
8. What hasn't the clown got?

9. What doesn't the knight have?
10. What isn't the clown doing?
11. What isn't the duck doing?
12. What hasn't the duck got?

LA1/28

1. What haven't the stork got?
2. What isn't the knight doing?
3. What hasn't the man got?
4. What isn't the man doing?
5. What hasn't the mouse got?
6. What isn't the stork doing?
7. What isn't the mouse doing?
8. What hasn't the clown got?
9. What hasn't the knight got?
10. What hasn't the clown doing... what isn't the clown doing
11. What isn't the duck doing?
12. What hasn't the duck got?

LA1/29

1. What hasn't the stork got?
2. What isn't the knight doing?
3. What hasn't the man got?
4. What isn't the man doing?
5. What hasn't the mouse got?
6. What isn't the stork doing?
7. What isn't the mouse doing?
8. What hasn't the clown got?
9. What hasn't the knight got?
10. What isn't the clown doing?
11. What isn't the duck doing?
12. What hasn't the duck got?

LA1/30

1. What hasn't the stork got?
2. What isn't the knight doing?
3. What hasn't the man got?
4. What isn't the man doing?
5. What hasn't the mouse got?
6. What isn't the stork doing?
7. What isn't the mouse doing?
8. What hasn't the clown got?
9. What hasn't the knight got?
10. What isn't the clown doing?
11. What isn't the duck doing?
12. What hasn't the duck got?

LA1/31

1. What doesn't the stork have?
2. What isn't the knight doing?
3. What doesn't the man have?
4. What isn't the man doing?
5. What doesn't the mouse have?
6. What isn't the stork doing?
7. What isn't the mouse doing?
8. What hasn't the clown got?
9. What hasn't the knight got?
10. What isn't the clown doing?
11. What isn't the duck doing?
12. What hasn't the duck got?

LA1/32

1. What doesn't the stork have?
2. Why isn't he doing anything?
3. What doesn't he have... a guitar?
4. Why isn't he doing anything?
5. What doesn't he have
6. What isn't he doing?
7. What isn't he doing?
8. What doesn't he have?
9. What doesn't he have?
10. What isn't he doing?
11. What isn't he doing?
12. What doesn't he have?

LA2/33

1. What hasn't the stork got?
2. What isn't the knight doing?
3. What hasn't the man got?
4. What isn't the man doing?
5. What hasn't the mouse got?
6. What isn't the stork doing?
7. What isn't the mouse doing?
8. What hasn't the clown got?
9. What hasn't the knight got?
10. What isn't the clown doing?
11. What isn't the duck doing?
12. What hasn't the duck got?

LA2/34

1. What doesn't he have?

2. What isn't he doing?
3. What doesn't he have?
4. What isn't he doing?
5. What doesn't he have?
6. What isn't he doing?
7. What isn't he doing?
8. What doesn't he have?
9. What doesn't he have?
10. What isn't he doing?
11. What isn't he doing?
12. What doesn't he have?

LA2/35

1. What hasn't he got?
2. What isn't he doing?
3. What hasn't he got?
4. What isn't he doing?
5. What hasn't he got?
6. What isn't he doing?
7. What isn't he doing?
8. What hasn't he got?
9. What hasn't he got?
10. What isn't he doing?
11. What isn't he doing?
12. What hasn't he got?

LA2/36

1. What hasn't the stork got?
2. What isn't the knight doing?
3. What hasn't the man got?
4. What isn't the man doing?
5. What hasn't the mouse got?
6. What isn't the stork doing?
7. What isn't the mouse doing?
8. What hasn't the clown got?
9. What hasn't the knight got?
10. What isn't the clown doing?
11. What isn't the duck doing?
12. What hasn't the duck got?

LA2/37

1. What hasn't he got?
2. What isn't he doing?
3. What hasn't he got?
4. What isn't he doing?
5. What hasn't he got?

6. What isn't he doing?
7. What isn't he doing?
8. What hasn't he got?
9. What hasn't he got?
10. What isn't he doing?
11. What isn't he doing?
12. What hasn't he got?

LA2/38

1. What hasn't he got?
2. What isn't he doing?
3. What hasn't he got?
4. What isn't he doing?
5. What hasn't he got?
6. What isn't he doing?
7. What isn't he doing?
8. What hasn't he got?
9. What hasn't the knight got?
10. What isn't the clown doing?
11. What isn't he doing?
12. What hasn't he got?

LA2/39

1. What hasn't the stork got?
2. What isn't the knight doing?
3. What has the man got?
4. What isn't the man doing?
5. What hasn't the mouse got?
6. What isn't the stork doing?
7. What isn't the mouse doing?
8. What hasn't the clown got?
9. What hasn't the knight got?
10. What isn't the duck doing?

LA2/40

1. What hasn't he got?
2. What isn't he doing?
3. What hasn't the man got?
4. What is he doing?
5. What hasn't the mouse got?
6. What isn't he doing?
7. What isn't he doing?
8. What hasn't the clown got?
9. What hasn't the knight got?
10. What isn't the clown doing?
11. What isn't the duck doing?

12. What hasn't the duck got?

LA2/41

1. What hasn't the stork got?
2. What isn't the knight doing?
3. What hasn't the man got?
4. What isn't the man doing?
5. What hasn't the mouse got?
6. What isn't the stork doing?
7. What isn't the mouse doing?
8. What hasn't the clown got?
9. What hasn't the knight got?
10. What isn't the clown doing?
11. What isn't the duck doing?
12. What hasn't the duck got?

LA2/42

1. What hasn't the stork got?
2. What isn't the knight doing?
3. What hasn't the man got?
4. What isn't the man doing?
5. What hasn't the mouse got?
6. What isn't the stork doing?
7. What isn't the mouse doing?
8. What hasn't the clown got?
9. What hasn't the knight got?
10. What isn't the clown doing?
11. What isn't the duck doing?
12. What hasn't the duck got?

LA2/44

1. What doesn't the stork have in the picture?
2. What isn't the knight doing in the picture?
3. The man in the picture doesn't have something... what is it?
4. What isn't the man doing?
5. What doesn't the mouse have?
6. What isn't the stork doing?
7. What isn't he doing?
8. What hasn't he got?
9. What hasn't he got?
10. What isn't he doing?
11. The duck isn't doing something... what is it?
12. What doesn't he have?

LA3/45

1. What doesn't the stork have?
2. What isn't he doing?
3. What doesn't the man have?
4. What isn't the man in the picture doing?
5. What doesn't the mouse have?
6. What isn't the stork doing?
7. What isn't the mouse doing?
8. What doesn't the clown have?
9. What doesn't the knight have?
10. What isn't the clown doing?
11. What isn't the duck doing?
12. What doesn't the duck have?

LA3/47

1. What does the stork not have?
2. What does the knight not have?... What is the knight not doing?
3. What does the man not have?
4. What is the man not doing?
5. What does the mouse not have?
6. What is the stork not doing?
7. What is the mouse not doing?
8. What does the clown not have?
9. What does the knight not have?
10. What is the clown not doing?
11. What is the duck not doing?
12. What does the ducj not have?

LA3/48

1. What hasn't the stork got?
2. What isn't the knight doing?
3. What hasn't the man got?
4. What isn't the man doing now?
5. What hasn't the mouse got?
6. What isn't the stork doing?
7. What isn't the mouse doing?
8. What hasn't the clown got?
9. What hasn't the knight got?
10. What isn't the clown doing?
11. What isn't the duck doing?
12. What hasn't the duck got?

LA3/49

1. What doesn't the stork have in the picture?
2. What is the knight not doing?
3. What does the man not have?
4. What is the man not doing?

5. What does the mouse not have?
6. What is the stork not doing?
7. What is the mouse not doing?
8. What does the clown not have in the picture?
9. What does the knight not have in the picture?
10. What is the clown not doing?
11. What is the duck not doing in the picture?
12. What does the duck not have in the picture?

LA3/50

1. What doesn't the stork have?
2. What is the knight not doing?
3. What doesn't the man have?
4. What isn't the man doing?
5. What doesn't the mouse have?
6. What isn't the stork doing?
7. What isn't the mouse doing?
8. What doesn't the clown have?
9. What doesn't the knight have?
10. What isn't the clown doing?
11. What is the duck not doing?
12. What doesn't the duck have?

LA3/51

1. What hasn't the policeman... um what hasn't the stork got?
2. What isn't the knight doing?
3. What doesn't the man have?
4. What isn't the man doing?
5. What doesn't the mouse have?
6. What isn't the stork doing?
7. What isn't the mouse doing?
8. What doesn't the clown have?
9. What doesn't the knight have?
10. What isn't the clown doing?
11. What isn't the duck doing?
12. What doesn't the duck have?

LA3/52

1. What doesn't the heron or stork have?
2. What isn't the knight doing?
3. What doesn't the man have?
4. What isn't he doing?
5. What doesn't the mouse have?
6. What isn't the stork doing?
7. What isn't the mouse doing?

8. What doesn't the clown have?
9. What doesn't the knight have?
10. What isn't the clown doing?
11. What isn't he doing?
12. What doesn't the duck have?

LA3/53

1. What doesn't the stork have?
2. What isn't the knight doing?
3. What doesn't the man have?
4. What isn't the man doing?
5. What doesn't the mouse have?
6. What isn't the stork doing?
7. What isn't the mouse doing?
8. What doesn't the clown have?
9. What doesn't the knight have?
10. What isn't the clown doing?
11. What isn't the duck doing?
12. What doesn't the duck have?

LA3/54

1. What hasn't the stork got?
2. What isn't the knight doing?
3. What hasn't the man got?
4. What isn't the man doing?
5. What hasn't the mouse got?
6. What isn't the stork doing?
7. What isn't the mouse doing?
8. What hasn't the clown got?
9. What hasn't the nice knight got?
10. What isn't the clown doing?
11. What isn't the duck doing?
12. What hasn't the duck got?

LA3/55

1. What has the stork hasn't got?
2. What isn't he doing?
3. What hasn't the man got?
4. What isn't he doing?
5. What hasn't the mouse got?
6. What's that... what isn't he doing?
7. What isn't he doing?
8. What hasn't he got?
9. What hasn't he got?
10. What isn't he doing?
11. What isn't he doing?

12. What hasn't he got?

Appendix 4: Transcriptions of SLI question formation

SLI1

Object Questions

1. What hasn't it got?
2. What isn't he doing?
3. What hasn't he got?
4. What isn't he doing?
5. What hasn't it got?
6. What isn't it doing?
7. What isn't it doing?
8. What ain't it got?
9. What hasn't it got?
10. What isn't it doing?
11. What isn't it doing?
12. What hasn't it got?

Subject Questions

1. Who isn't?
2. Who hasn't?
3. Who isn't?
4. Who hasn't?
5. Who isn't?
6. Who hasn't?
7. What isn't flying?
8. What hasn't?
9. What isn't?
10. What hasn't got any?
11. What isn't?
12. What hasn't?

SLI2

Object Questions

1. What does the stork doesn't have?
2. What is the knight not doing?
3. What doesn't the man have something?
4. What the man isn't doing?
5. What the mouse doesn't have something?
6. What doesn't the stork have? (Question 1 repeated)
7. What isn't he doing?
8. What the clown not have?
9. What doesn't the knight doesn't have?
10. What isn't he doing?
11. What he isn't doing?
12. What does the duck haven't?

Subject Questions

1. Who aren't on the bike?
2. Who hasn't got shoes?
3. Who isn't singing?
4. Who hasn't got a violin?
5. Who isn't fighting?
6. Who hasn't got a sword?
7. What isn't flying?
8. What needs a basket?
9. What isn't caught?
10. What should have cheese?
11. What isn't running?
12. What hasn't got feathers?

SLI3

Object Questions

1. What has the stork got?
2. What is the knight doing?
3. What does the man in the picture doesn't have?
4. What is the man not doing?
5. What the mouse doesn't have?
6. What is the stork not doing?
7. What isn't the mouse doing?
8. What does the clown erm not doing?
9. What doesn't the knight have?

10. What isn't the clown doing?
11. What isn't the duck doing anything?
12. What doesn't the duck have?

Subject Questions

1. Who isn't on a bike?
2. Who has not got shoes on?
3. Who should be singing?
4. Who hasn't got a violin?
5. Who isn't fighting?
6. Who hasn't got a sword?
7. What isn't flying?
8. What hasn't got a basket?
9. What should be caught?
10. What hasn't got any cheese?
11. What isn't running?
12. What hasn't got feathers?

SLI 4

Object questions

1. What doesn't the stork have in the picture?
2. What's he not doing in the picture?
3. What doesn't the man have in the picture?
4. What isn't he doing?
5. What's not in the picture?
6. What's he not doing?
7. What's not the mouse doing in the picture?
8. What doesn't the clown have in the picture?
9. What doesn't he have something?
10. The clown is doing not what in the picture?
11. What's he not doing in the picture?
12. What's not in the picture?

Subject Questions

1. Who haven't a bike?
2. Who hasn't got shoes on?
3. Who isn't singing?
4. Who hasn't got a violin?
5. Who isn't fighting?
6. Who hasn't got a sword?
7. What isn't flying?
8. Who hasn't got a basket?
9. What isn't caught?
10. What doesn't have cheese?

11. What is not running?
12. What hasn't got feathers?

SLI 5

Object Questions

1. What doesn't he have?
2. What is he doing?
3. What is he supposed to have?
4. What is he supposed to do?
5. What doesn't the mouse have?
6. What isn't he doing?
7. What is he supposed to do?
8. What is he supposed to wear?
9. What is he supposed to have?
10. What is he supposed to do?
11. What is he supposed to do?
12. What doesn't he have?

Subject Questions

1. Who isn't on the bike?
2. Who hasn't got shoes?
3. Who someone should be singing?
4. Who should have a violin?
5. Who isn't fighting?
6. Who hasn't got a sword?
7. What isn't flying?
8. What should have a basket?
9. What isn't caught?
10. What doesn't have any cheese?
11. What isn't running?
12. What should have feathers?

SLI6

1. What the stork haven't got?
2. What is the knight not doing?
3. What the man haven't got?
4. What the man isn't doing?
5. What the mouse haven't got?
6. What the stork isn't doing?
7. What the mouse isn't doing?
8. What the clown haven't got?
9. What the knight haven't got?
10. What the clown isn't doing?

11. What the duck isn't doing?
12. What the duck hasn't got?

Subject Questions

1. Who isn't on a bike?
2. Who someone haven't got shoes on?
3. Who should be singing?
4. Who hasn't got a violin?
5. Who isn't fighting?
6. Who hasn't got a sword?
7. What isn't flying?
8. What hasn't got a basket?
9. What isn't trapped?
10. What hasn't got any cheese?
11. What should be running?
12. What hasn't got feathers?

SLI 7

1. What doesn't the stork have?
2. What isn't the knight doing?
3. What doesn't the man have?
4. What isn't the man doing?
5. What doesn't the mouse has?
6. What isn't the stork doing?
7. What is the mouse not doing?
8. What doesn't the clown have?
9. What does the knight have?
10. What isn't the clown doing?
11. What isn't the duck doing?
12. What does the duck haven't?

Subject Questions

1. Who isn't on the bike?
2. Who should have shoes?
3. Who isn't singing?
4. Who doesn't have a violin?
5. Who isn't fighting?
6. Who has not got a sword?
7. What isn't flying?
8. What hasn't got a basket?
9. What isn't trapped?
10. What should have some cheese?
11. Who is not running?
12. What hasn't got feathers?

SLI 8

1. What hasn't he got?
2. What isn't he doing?
3. What hasn't he got?
4. What isn't he doing?
5. What doesn't he the mouse have?
6. What isn't the stork doing?
7. What isn't the mouse doing?
8. What doesn't the clown have?
9. What doesn't the knight have?
10. What isn't the clown doing?
11. What is... what is the duck doing?
12. What haven't the duck have?

Subject Questions

1. Who isn't on a bike?
2. Who has not got shoes on?
3. Who isn't singing?
4. Who has a violin?
5. Who isn't fighting?
6. Who hasn't got a sword?
7. What isn't flying?
8. What hasn't got a basket?
9. What isn't caught?
10. Who hasn't got any cheese?
11. What isn't running?
12. Who hasn't got any feathers?

SLI9

1. What hasn't he got?
2. What is it he's not doing?
3. What doesn't he have?
4. What is it he's not doing something?
5. What hasn't he got something?
6. What is he not doing something?
7. What isn't he not doing something?
8. What have he got?
9. What hasn't he got?
10. What is he... what is it he's not doing something?
11. What is it he's not doing something?
12. What is it he hasn't got?

Subject Questions

1. Who should be on the bike?
2. Who has not got shoes on?
3. Who isn't singing?
4. Who someone has not got a violin?
5. Who isn't fighting?
6. Who hasn't got a sword?
7. What isn't flying?
8. What something should have a basket?
9. What isn't caught?
10. What something haven't got some cheese?
11. What something are not running?
12. What hasn't got feathers?

SLI10

1. What doesn't he have?
2. Should he have something?
3. What is that?
4. What could that be?
5. What should he have in the box?
6. What is he not doing?
7. What should it be doing?
8. What doesn't the clown have?
9. What doesn't he have?
10. Why should he do something?
11. What should he be doing?
12. Should he have some feather?

Subject Questions

1. Who isn't on the bike?
2. Who should have shoes?
3. Who isn't singing?
4. Who hasn't got a violin?
5. Who isn't fighting?
6. Who hasn't got a sword?
7. What isn't flying?
8. What hasn't got a basket?
9. What isn't trapped?
10. What doesn't have some cheese?
11. Who is not running?
12. What hasn't got feathers?

SLI11

1. What the stork haven't have?
2. What him doing not... not doing something?
3. What the man don't have something?
4. What he not doing something?
5. What the mouse didn't have?
6. What he... him not doing something?
7. What him haven't doing anything?
8. What the clown haven't been doing?
9. What him haven't?
10. What the clown haven't doing anything?
11. What him not doing something?
12. What the duck haven't something?

Subject Questions

1. Who not on the bike?
2. Who has not got shoes on?
3. Who not singing?
4. Who hasn't got a violin?
5. Who isn't fighting?
6. Who hasn't got a sword?
7. What isn't flying?
8. What something haven't got a basket?
9. What something aren't caught?
10. What hasn't got any cheese?
11. Who is not running?
12. What something haven't got feathers?

SLI12

1. Did the stork have something with it?
2. Is the knight doing something?
3. Don't know
4. What is the man doing?
5. What does the mouse have?
6. What is the stork doing?
7. What is the mouse doing?
8. What does the clown have?
9. What does the knight have?
10. What is the clown doing?
11. What is the duck doing?
12. What doesn't the duck have?

Subject Questions

1. Who isn't on a bike?

2. Who hasn't got shoes on?
3. Who isn't singing?
4. Who hasn't got a violin?
5. Who isn't fighting?
6. Who hasn't got a sword?
7. What isn't flying?
8. What hasn't got a basket?
9. What isn't caught?
10. What doesn't have cheese?
11. What is not running?
12. What hasn't got feathers?

SLI13

1. What is missing from the pelican?
2. What is the knight not doing?
3. What is the man hasn't got in the... hasn't got?
4. What isn't he doing?
5. What does not the mouse haven't... hasn't got?
6. What is the stork not doing?
7. What is the mouse not doing?
8. What does not the clown... what doesn't the clown have?
9. What does the knight not have?
10. What is the clown not doing?
11. What is the duck not doing?
12. What does the duck doesn't have?

Subject Questions

1. Who isn't on a bike?
2. Who hasn't got shoes on?
3. Who is not singing?
4. Who needs a violin?
5. Who isn't fighting?
6. Who doesn't have a sword?
7. What isn't flying?
8. What hasn't got a basket?
9. What should be caught?
10. What hasn't got cheese?
11. What isn't running?
12. What hasn't got feathers?

SLI14

1. What is that?
2. Doing what?
3. What's that?

4. Doing what?
5. Doesn't have what?
6. Doing what?
7. Doing what?
8. Doesn't have what?
9. Doesn't have what?
10. Doing what?
11. Doing what?
12. Doesn't have what?

Subject Questions

1. Who isn't on a bike?
2. Who someone hasn't got shoes on?
3. Who isn't be singing?
4. Who someone haven't got a violin?
5. Who isn't fighting?
6. Who hasn't got a sword?
7. What isn't flying?
8. What hasn't got a basket?
9. What is not caught?
10. What hasn't got any cheese?
11. Something isn't running, what?
12. Something hasn't got feathers, what?

*'Who did you see on the road?' the King went on, holding out his hand to the
Messenger for some more hay.*

'Nobody,' said the Messenger.

'Quite right,' said the King: 'this young lady saw him too.

So of course Nobody walks slower than you.'

'I do my best,' the Messenger said in a sulky tone.

'I'm sure nobody walks much faster than I do!'

'He can't do that,' said the King, 'or else he'd have been here first'

Lewis Carroll