Paths in First Language Acquisition: Motion through Space in English, French and Japanese

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Part I

Framing the Debate: Preliminary Perspectives on Motion Events

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Abstract

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This thesis examines how children attain the linguistic knowledge they need to grammatically express basic trajectories through physical space in English, French and Japanese. In Talmy's (1991; 2000b) descriptive binary typology, 'verb-framed' languages such as Japanese and French systematically encode PATH (or 'direction') in verbs, whilst 'satellite-framed' languages such as English systematically do so in adpositions. How such phenomena might be formalized is considered in terms of two contrasting hypotheses: (i) the Path Parameter Hypothesis, which suggests binary parameterization at the whole-language level, and (ii) the Lexicalist Path Hypothesis, which suggests that all relevant aspects of PATH predication are determined at the level of individual lexical items. Two experiments with original research methodology were conducted with English, French and Japanese children and adults. In Experiment I, directional predicates were elicited using a purpose-designed picture-story, and in Experiment II, grammaticality judgements were elicited from the same test subjects. Whilst predictions of general tendencies were upheld (strongly for English and Japanese, weakly for French), several findings support a non-parameterized, lexicalist account of PATH predication. First, in all child age groups, the three languages fell into discrete response categories for directional utterances in the absence of an inherent PATH verb. Second, both lexicalization types were found in each language, again in all age groups. Third, the three languages are revealed to have a shared syntax of directional predication, involving the same set of interpretable features and the same set of basic syntactic structures, including a layered PP structure. These findings suggest that whilst the typology remains broadly descriptive, there is no language-particular grammar involved in this variation. Rather, both directional V and a fully articulated PP structure are available in all three languages, show no discernable development, and are presumably part of the machinery of Universal Grammar. Children already understand the syntactic possibilities in the predication of PATH, but must learn the particular complexities of their lexicon, the primary locus of variation in the linguistic expression of motion events.

Preface: Motion events and Universal Grammar

This thesis examines syntactic structures and lexicalization patterns in one semantic domain – direction in motion events – with special reference to original acquisition data from three languages – English, French and Japanese – and concludes that children are able to acquire the grammar of directional predication in any language through the combination of two factors: (i) knowledge of a universal syntax, with combinatorial and interpretive principles common to all languages, and (ii) the development of a lexicon, which is able to package grammatically-relevant concepts into individual words, creating a language-particular vocabulary that shapes syntactic structures. Syntactic principles in the domain of motion events appear to be invariable both across languages and throughout the acquisition process, whilst differences both between languages and in the development of children's grammars appear to be due to differences in the lexicalization of those concepts which play roles in syntax. Crosslinguistic variation in this domain may be accounted for without recourse to either 'parameters' at the level of entire languages (Chomsky, 1981), or 'cognitive predispositions' at the same level (Slobin, 1996). Rather, the theoretical investigations and empirical findings of this thesis support the notion that the lexicon is the primary locus of language variation. This notion, in various guises, appears as a discernable vein of research in generative grammar, and raises the question of whether the time has come to sound the death knell for all residues of language-particular grammars (see e.g. Borer, 1984; Ouhalla, 1991; and Emonds, 2000).

The general structural organization of this thesis is as follows. Part I deals with preliminary matters, providing theoretical background, and defining the issues to be addressed. Chapter 1 supplies an introduction to basic motion event terminology, such

as the features PATH ('direction') and PLACE ('location'), and sets out the proposed binary typology which functions as the springboard for the thesis, namely the division of the world's languages into 'satellite-framed' languages, which systematically encode direction in adpositions or affixes, and 'verb-framed' languages, which do so in verbs (Talmy, 1991). A review is provided of recent typological research, after which a change in perspective is proposed, away from the concept of 'most characteristic expression', and toward the study of 'possible human grammar'. Chapter 2 suggests two ways in which variation in the predication of PATH might be formalized: either as a parameter in the Principles and Parameters framework (Chomsky, 1981), or in terms of selection at the level of individual lexical items (following work by Jackendoff, 1990, and Emonds, 1991, 2000). These views are expressed as testable hypotheses with contrasting predictions: (i) the *Path Parameter Hypothesis (PPH)*; and (ii) the *Lexicalist Path Hypothesis (LPH)*. Chapter 3 covers one final, pivotal, preliminary issue: the means by which lexical comparison can be made possible given general non-equivalence between items in both the open- and closed-class lexicons of the three languages. A solution is provided in the form of sub-lexical 'computational semantic features', which are defined in advance of their application in experimental research.

Part II provides descriptions and analyses of the empirical work at the heart of this research project. Chapter 4 discusses the rationale and methodology of the elicited production technique adopted in Experiment I, and describes the experimental procedure. The results of Experiment I are presented in Chapters 5 and 6. Chapter 5 deals with those results bearing directly on Talmy's (1991) typological classification, first by giving detailed response breakdowns for each language, and then by crosslinguistic comparison. Chapter 6 moves away from the differences between

languages, and presents those results bearing on shared aspects of categorization and syntax. However, it is in the nature of elicited production that whilst the data reveal what participants can say, the absence of particular forms does not confirm their ungrammaticality. Chapters 7 and 8 respectively describe the methodology and results of Experiment II, which attempted to probe children's and adults' knowledge of ungrammaticality of particular forms. Taken together, Experiments I and II furnish robust support for the lexicalist approach to variation in the predication of PATH, and, perhaps surprisingly, reveal a common, rather than parameterized, syntax of motion events. Trajectories were expressed using the same syntactic categories and computational semantic features in each language, which were combined in accordance with arguably universal syntactic principles. Children's errors were all of a lexical nature, and knowledge of the relevant aspects of syntax showed itself to be present from the outset, and mostly likely part of the 'initial state'.

On the basis of the empirical findings, Part III attempts to give a more thorough theoretical analysis of both lexical and syntactic issues in the expression of directed motion. In Chapter 9, the terms in which the typology was coined are subject to re-examination, as it is not at all clear *a priori* that 'path' and 'satellite' have the same (if any) theoretical status in alternative frameworks. Chapter 10 takes up the nature of computational semantic features (whose role in syntactic derivations was taken as read in the earlier chapters), and Emonds' (1991, 2000) system of extended subcategorization is compared to Jackendoff's (1990) equally descriptive semantic structure approach, the former being preferred on grounds of parsimony. A strong version of the Lexicalist Path Hypothesis is adopted, in which all variation in the expression of directional motion events, both within and between languages, stems from variation in the specifications of lexical items. It is argued that children's errors

in the predication of PATH reveal initial underspecification of semantic features, although this results in a learnability paradox which remains unresolved. In Chapter 11, discussion turns to the syntax of directed motion, especially as expressed in PP. The internal structure of layered PP is shown to be fixed and inviolable in English, French and Japanese, and evidence from other languages is provided to argue that this hierarchy is crosslinguistically pervasive. Such fundamental aspects of the *syntax* of motion events need not be acquired at all: rather, they constitute part of Universal Grammar, the initial state, and may themselves support the acquisition of the lexicon. Finally, in Chapter 12, a summary is provided of the main findings and contentions of the thesis.

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TABLE OF CONTENTS

PART II
Experimentation

Abbreviations used in glosses

ACC	accusative case marker
ASP	aspect (used for the various forms of the Japanese light verb *shimau* (*chau*), sometimes but not always translatable into English with 'go and', e.g. he's gone and left; he's gone and broken the record)
AUX	auxiliary (used to gloss both French *avoir* 'have' and *être* 'be' in their auxiliary function)
DAT	dative case
EXC	exclamative
GEN	genitive case
HON	honorific
INT	intentional morpheme, used to gloss the Japanese suffix *-yō*, translatable as 'want to', 'would like to', etc.
NOM	nominative case
ONOM	onomatopoeia
P	pre- or postposition (used to gloss featureless, late-inserted P such as English *of*, French *de*, and Japanese *no*; or alternatively to gloss French *en* in cases of ambiguity between cause (*by* doing something) and correlation (*while* doing something))
PART	particle (used for Japanese discourse particles irrelevant to the syntax. Never used for 'verbal particles', which are here argued to be of the category P)
P_{LOC}	Locative P, used as a default to gloss spatial prepositions whose closest English analogues are different enough so as to be misleading if used in glosses)
PROG	progressive (continuous) aspect (especially used for Japanese *te iru* construction, which in the elicted production transcripts was phonologically cliticized to the verb)
PST	past tense
TE	Japanese -TE form (This verbal suffix has two main functions, both exemplified in the following utterance from a Japanese 6-year-old (example 4.14 in the main text): *dōkutsu no naka e hashitte, ōmu-san o oikakete ikimasu* - cave GEN inside to run-TE, parrot-HON ACC chase-TE go -'He runs inside the cave, and goes chasing after the parrot.' The first use corresponds to a complementizer function, demarcating a subordinate clause, which could be (poorly) translated with an *on*-phrase (e.g. *On running into the cave, he goes chasing after the parrot*), but is often translated with the connective *and* (as in this example). The event in the *te*-clause occurs before the other event in the matrix clause. The second use of this suffix is to indicate that two activities are simultaneous. Thus the 'chasing' and the 'going' occur at the same time – they are different aspects of the same event. In examples from the data where –TE has this second function, and where confusion with the other function is not possible, I occasionally gloss it as English *-ing*, for ease of comprehension.)
TITLE	used to gloss Japanese *-san* (Mr., Mrs., Miss., etc.)
TOP	topic marker

PART I

FRAMING THE DEBATE:
PRELIMINARY PERSPECTIVES ON MOTION EVENTS

Chapter 1

Crosslinguistic patterns in the predication of Path

Proposals for universals or restrictive typologies in the world's languages are also claims about linguistic knowledge in the minds of children. If they stand up to scrutiny, they count as discoveries that help us understand how human children can learn any one of thousands of different human languages with equal success. Given the apparent kaleidoscope of possibilities in human grammar, universals and narrow typologies imply a welcome simplification of the acquisition task. One area of language that has received a great deal of attention in this regard over the last two decades or so is the expression of spatial concepts in the lexicon and in syntax. Typological investigations have suggested an extremely limited range of variation in the way motion events are linguistically represented, grouping together vast numbers of languages independently of cultural traditions or social factors (e.g. Berman and Slobin, 1994; Talmy 1985, 1991, 2000b). Variation in the linguistic expression of trajectories in motion events has been attributed to a widely-accepted binary typology: 'satellite-framed' languages generally encode direction in adpositions or affixes, whilst 'verb-framed' languages do so in verbs (Talmy, 1985). If these are indeed two choices in a binary typology, various questions arise concerning what children may already know and what they must learn about their own language in this regard. However, healthy scepticism should accompany such proposals, which are inevitably based on limited data sets from individual languages, and on comparative samples much smaller than the estimated 6000 languages spoken in the world today. If this typology proves inaccurate or over-simplified, an alternative account must be given

for how children acquire the lexical items and the syntax needed to express paths through space.

The sections below begin with an introduction to basic motion event terminology in cognitive linguistics, which is perhaps less familiar in other syntactic and semantic traditions. A review is then provided of the proposed binary typology for the expression of motion events, and of recent suggestions that a more fine-grained analysis is required to account for the range of language types. The conclusions of this cognitive linguistic research are then re-examined in the light of a contrast which always informs the generative approach: *knowledge* of language versus *use* of language (Chomsky, 1986). This permits a shift in perspective from the study of characteristic expression to the study of the mental representations of grammar.

1.1 Semantic elements in motion events

The binary typology for expressing direction in motion events is couched in terms of a theory of event semantics that has at its core a small number of universal semantic elements. These are mapped to overt linguist forms such as verbs and nouns by a process variously referred to as 'lexicalization' (McCawley, 1968), 'incorporation' (Gruber, 1976 [1965]), or 'conflation' (Talmy, 1972). The most relevant of these elements for subsequent discussion are FIGURE, GROUND, MOTION, MANNER and PATH, as described in Talmy's pioneering works on language and cognition (e.g. Talmy, 1972, 1975, 1983, 1985, 1991, 2000a, 2000b).[1] The terminology of FIGURE and GROUND was adapted from Gestalt psychology by Talmy (1972) to elucidate a fundamental dichotomy in syntactic argument relations: the FIGURE is the object that is

[1] Several influential articles by Talmy (e.g. 1983, 1985, 1991) have been revised and republished in Talmy (2000a, 2000b). Where appropriate, I will cite the original and/or the revised version.

moving or located with respect to the GROUND.[2] In the more widespread terminology of thematic roles, the FIGURE may correspond to either the 'theme' or the 'agent', whilst the GROUND may correspond to the 'source', 'location', or the 'goal', depending on the argument structure. Thus in the following examples, the seagull is always the FIGURE and the hole is always the GROUND.

(1.1) a. The seagull perched in front of the hole.

b. The seagull darted into the hole.

c. The fox dragged the seagull out of the hole.

d. The fox covered the hole with the seagull.

The FIGURE / GROUND distinction is understood to be conceptual rather than syntactic in most analyses of argument structure, as verbs select properties of the FIGURE and/or the GROUND *irrespective of their syntactic position*. For example, the verb *wrap* requires that the FIGURE in the event be conceptualized as a 2-dimensional, flexible solid, whether this FIGURE is a direct object or not.

(1.2) a. Harry wrapped the fish with {a banana leaf/*a box/*olive oil}.

b. Harry wrapped {a banana leaf/*a box/*olive oil} around the fish.

Similarly, the verb *splash* requires that the FIGURE be a 3-dimensional aggregate consisting of psychologically dimensionless drops of liquid, whilst verbs such as *fill*, *cover* and *edge* require that the GROUND be respectively conceptualized as a volume,

[2] In Gestalt psychology, the terms 'figure' and 'ground' were originally employed in the study of human pattern recognition, building on classic studies of images involving dual and contradictory readings such as Jastrow's (1899) discussion of the duck/rabbit image (often misattributed to Wittgenstein), or the vase/faces illusion created by Rubin (1921 [1915]).

a surface or a line (see Pinker, 1989: Ch.5 for discussion). Many of the directional verbs at the heart of this study impose similar restrictions on their GROUND arguments, to various degrees. For example, the English verb *enter* selects a GROUND that is a 3-dimensional internal space (whether conceptualized as solid, liquid, gas or empty).

(1.3) a. The arrows entered his body.

b. The chemical entered her bloodstream.

c. The climber entered the clouds.

d. The bat entered the cave.

MOTION expresses the presence of motion or location *per se* in the event, and is subdivided by Talmy (1985) into MOVE in the case of displacement, and BE_{LOC} in the case of 'being' in a single 'location'. The term MANNER describes the way in which an object moves or is located. In Talmy's terminology, PATH describes either the trajectory of a moving object or the location of a moveable object. However, in this thesis, as in most work influenced by Talmy's approach, a distinction is made between PATH in a directional sense, and another element characterizing static location, here termed PLACE. This PATH / PLACE distinction has been adopted across theoretical frameworks: in semantic structure theory (Jackendoff, 1990: 43-46), subcategorization theory (Emonds, 2000: 36-47), minimalist syntax (Ayano, 2001: 26-28) and cognitive linguistics (Lakoff, 1987: 425). Even in Talmy's own work, PATH is very rarely used in locational contexts. Throughout this thesis, I use PATH only in a directional sense. These distinctions may be exemplified as follows:

(1.4) The blossoms fluttered onto the green grass.

flutter → MOTION (MOVE) + MANNER' / *onto* → PATH

(1.5) The blossoms fluttered on the black bough.

flutter → MOTION (BE_{LOC}) + MANNER / *on* → PLACE

In these 'fluttering' events, *onto* expresses a PATH, whilst *on* does not, and the two instances of *flutter* are two distinct lexicalizations, one conflating MOTION (MOVE) with MANNER, and the other conflating MOTION (BE_{LOC}) with MANNER. However, once the PATH / PLACE distinction is adopted, the MOVE / BE_{LOC} distinction is redundant. I assume that in such cases there is a single lexical entry e.g. *flutter* [MOTION] with the difference in locational or directional interpretation due solely to the PP.

1.2 Paths and Satellites

The notions of 'path' and 'satellite' are key to understanding the binary typology, yet definitions of these terms vary significantly in the cognitive linguistics literature. Firstly, 'path' is often conceived of as a semantic primitive both in lexical concepts and in syntactic/semantic computations, meaning something like 'direction', and it is posited as a component of lexical entries such as *go*, *enter*, and *across* (e.g. Berman and Slobin, 1994; Talmy, 1985, 1991). Secondly, 'path' may be considered not as a primitive but as a lexical conceptual element subject to further decomposition (Talmy, 2000b).[3] Thirdly, 'path' may be seen as a sentential (more specifically phrasal) semantic element (Ross, 1995). Fourthly, it is also treated as a more complex conceptual entity meaning something like 'journey', so that a three-page narrative

[3] When I use the term in these first two senses (i.e. as a conceptual primitive or as a combinatorial semantic element), I transcribe it as PATH (small caps).

recounting a journey is one big 'path' (Slobin, 1996). A detailed critique of these approaches will be provided in Chapter 9. For the moment, let us assume the first interpretation, which is the most widely understood, the most relevant for the binary typology, and corresponds to Talmy's (e.g. 1985, 1991) general use of the term. Talmy (2000b: 25) gives one definition as follows:

(1.6) **Talmy's Path Definition**: The Path (with a capital P) is the path[4] followed or site occupied by the Figure object with respect to the Ground object.

As discussed above, the extension of the category to static locations is at odds with what has become the most conventional notion of PATH, which is strictly directional. This notwithstanding, the interpretation of PATH as a relational concept involving Figure and Ground is now standard in the cognitive literature, and may be taken as a starting point for this analysis. As such, PATH is usually lexicalized in major relational categories. In standard generative terms, this means V or P; however, the binary dichotomy is stated in terms of the relational categories 'verb' and 'satellite'.

The term 'satellite' was introduced by Talmy (1985) in an attempt to provide a unified treatment for the expression of PATH in verb particles, prepositions, postpositions, affixes and case particles, whether in free forms or in bound morphology. Perhaps a clearer sense of what is meant by 'satellite' can be had by looking at the following list of examples, taken from Talmy (2000b: Ch.1 [Talmy, 1985]). These include: (a) English verb particles; (b) English prefixes; (c) German separable prefixes; (d) German inseparable verb prefixes; (e) Latin prefixes; (f)

[4] Although it is of course undesirable to use the term being defined in its own definition, I consider that Talmy's (2000b) intended meaning is clear. The word 'path' as used in the definition was originally 'course' in Talmy (1985).

Russian prefixes; (g) Chinese verb complements; and (h) Atsugewi polysynthetic affixes around the verb root, as briefly exemplified below (satellites in italics).

(1.7)	a. run *in*; run *across*; freeze *stuck*; come *loose*	English
	b. *un*screw; *mis*fire	”
	c. *entzwei*brechen – *in-two*-break – ‘to break in two’	German
	d. *zer*brechen – *pieces*-break – ‘to break into pieces’	”
	e. *in*volare – *in*-fly – ‘to fly in’	Latin
	f. *v*letet – *in*-fly – ‘to fly in’	Russian
	g. pião *guò* – float *past* – ‘to float past’	Chinese
	h. *~ict* – ‘into liquid’; *~cis* – ‘into fire’	Atsugewi

It is debatable whether these elements all denote PATHS, and whether they are subject to uniform syntactic analysis. I return to these issues in Chapter 9. Talmy’s satellite definitions have evolved since the first coining of the term, and a closer look at these may elucidate the range of interpretations that this notion currently enjoys. Listed chronologically below are three such definitions:

(1.8) ‘…*a type of surface constituent* that has not generally been recognised as such in the linguistics literature, one that we term a ‘satellite’. Present in many if not all languages, satellites are certain *immediate constituents of a verb root* other than inflections, auxiliaries or nominal arguments. They relate to the verb root as periphery (or modifiers) to a head. A verb root together with its satellites forms a constituent in its own right, the ‘verb complex’, also not generally recognized. […] In some cases, elements

> that are encountered acting as satellites to a verb root otherwise belong to particular recognizable grammatical categories; therefore it seems better to consider the satellite role *not as a grammatical category in its own right, but as a new kind of grammatical relation*.' [my italics]
>
> (Talmy, 1985: 102)

(1.9) '…the satellite…is the *grammatical category* of any constituent other than a nominal complement that is in a sister relation to the verb root.' [my italics]

(Talmy, 1991: 486)

(1.10) '[the satellite]…is the *grammatical category* of any constituent other than a noun phrase or a prepositional-phrase complement that is in a sister relation to the verb root.' [my italics]

(Talmy, 2000b: 102)

The initial definition is wary of granting categorial status, as several satellites belong to 'recognizable grammatical categories', and prefers to introduce the term as a kind of relation. The more recent definitions do, however, claim categorial status for this term, attempting to distinguish satellites from pre/postpositions and adjectives.[5] This brief sketch might lead one to conclude that on this latter analysis, a word such as *through* is a satellite when used intransitively as a verb particle (e.g. *He ran through*), but a preposition when used transitively as the head of a PP (e.g. *He ran through the*

[5] This desire is clearly present even in the initial work: Talmy (1985: 103) states that in a sentence such as *I ran out of the house*, *out of* comprises a satellite (*out*) and a preposition (*of*). Thus *ran out* is a constituent 'verb complex', followed by a PP *of the house*. In Chapter 9 this issue will be readdressed, and it will be argued that such verb complexes fail standard tests of syntactic constituency.

tunnel). However, this distinction is often blurred in crosslinguistic generalizations concerning motion events, including the verb-framed / satellite framed distinction. As we shall see, examples such as *The bottle floated into the cave* and *The bottle floated across the canal* (in which *into the cave* and *across the canal* are demonstrably constituent PPs) are given as examples of 'satellite-framed' grammar, contrasting with 'verb-framed' equivalents paraphraseable as 'enter the cave floating' and 'cross the canal floating' (cf. Talmy, 1985: 69, 1991: 488, 2000b: 49, 227).

I shall later argue that Talmy's (1985) initial wariness as regards the claim of categorial status was well-founded, as the PATH satellites of English do indeed reduce to recognizable grammatical categories (see Section 9.2.1). Nevertheless, for the purposes of exposition the term 'satellite' shall be retained in these first chapters, in order to set out the binary typology which is at the heart of the investigation.

1.3 Talmy's typology

Talmy (1991) observes that lexicalization patterns differ across languages as regards the expression of PATH. Intriguingly, there appear to be only two major typological classes. Each language selects one characteristic conflation type in the expression of motion:

(i) *'Satellite-framed' languages* canonically encode PATH in a 'satellite' to the verb, such as a preposition, postposition, or particle (MANNER is often expressed in the primary predicate).

(ii) *'Verb-framed' languages* canonically encode PATH in the verb (MANNER is either omitted or expressed in an adjunct position).[6]

I shall refer to this distinction throughout the thesis as 'Talmy's typology'. On the issue of the breadth of the generalization, Talmy (1991: 486) suggests that satellite-framed ('S-framed') languages include 'most Indo-European minus Romance, Finno-Ugric, Chinese, Ojibwa, and Walpiri', whilst verb-framed ('V-framed') languages include 'Romance, Semitic, Japanese, Tamil, Polynesian, most Bantu…, most Mayan, Nez Perce, and Caddo'. Slobin (1996: 205) reports that at a workshop on this topic at the University of New Mexico in 1995, Talmy's claim was tentatively confirmed for the S-framed languages Dutch, English, German, Icelandic, Polish, Russian, Serbo-Croatian, Swedish and Walpiri; and also for the V-framed languages Moroccan Arabic, French, Hebrew, Italian, Japanese, Portuguese, Spanish and Turkish. These claims are shown in the following table.

Table 1.1. *Samples of proposed S-framed and V-framed languages and language groups.*

S-framed languages	V-framed languages
English, Dutch, German, Icelandic, Swedish, Polish, Russian, Serbo-Croatian, Yiddish, Finnish, Hungarian, Mandarin, Cantonese, Thai, Ojibwa, Warlpiri	French, Spanish, Italian, Portuguese, Arabic, Hebrew, Turkish, Tamil, Polynesian, Basque, Japanese, Korean, (most) Bantu, (most) Mayan, Nez Perce, Caddo

A first glance at common expressions of PATH in English, French and Japanese appears to support the generalization. Where English generally expresses PATH in P, both French and Japanese generally do so in V. The following PATH concepts

[6] Talmy's (1991, 2000b) claim is, in fact, broader than this. He proposes to extend the S-framed / V-framed distinction to account not only for lexicalization patterns in motion events, but for a grouping of event types, as discussed below in Section 2.1.2.

represented by prepositions in English generally correspond to verbs in French and Japanese.

Table 1.2. *Some common path predicates in English, French and Japanese*.

English	French	Japanese
into	*entrer* ('enter')	*hairu* ('enter')
out	*sortir* ('go-out')	*deru* ('go-out')
up	*monter* ('go-up')	*noboru / agaru* ('climb' / 'go-up')
down	*descendre* ('go-down')	*oriru* ('go-down')
back	*rentrer* ('go-back')	*kaeru* ('go-back')
across	*traverser* ('cross')	*yokogiru / wataru* ('cross')
past	*passer* ('go-via')	*tooru* ('go-via')
through	*passer par* ('go-via via')	*toorinuku* ('go-via-emerge')

These two lexicalization patterns are exemplified below in English, French and Japanese, with PATH predicates in italics.

(1.11) a. Chihiro danced *into* the house. ENGLISH:

b. Chihiro danced *up* the stairs. S-FRAMED

c. Chihiro danced *across* the street.

(1.12) a. Chihiro est *entré* dans la maison en dansant. FRENCH:

Chihiro AUX entered in the house P dancing[7] V-FRAMED

'Chihiro danced into the house.'

b. Chihiro a *monté* l'escalier en dansant.

Chihiro AUX went-up the stairs P dancing

'Chihiro danced up the stairs.'

[7] The French 'grammatical' P *en* is ambiguous here between a durative reading (close in meaning to English *while*), and a causal reading (close in meaning to English *by / by means of*). I leave this simply as P in the gloss.

c. Chihiro a *traversé* la rue en dansant.
Chihiro AUX crossed the street P dancing
'Chihiro danced across the street.'

(1.13) a. Chihiro wa uchi ni odotte *haitta.*[8] JAPANESE:
Chihiro TOP house P_{LOC} dancing entered V-FRAMED
'Chihiro danced into the house.'

b. Chihiro wa kaidan o odotte *nobotta.*
Chihiro TOP stairs-ACC dancing climbed
'Chihiro danced up the stairs.'

c. Chihro wa michi o odotte *yokogitta.*
Chihiro TOP street ACC dancing crossed
'Chihiro danced across the street.'

The claim that human languages must 'select' one of these two lexicalization patterns is an interesting and empirically testable claim, and indeed during the last decade or so, many languages have been subjected to investigation in this regard. The most influential contributions are perhaps those collectively known as 'the frog story' studies, which have provided ample quantities of empirical data with which to flesh out the debate.

1.4 The Frog Stories

A simple research technique has now been used in hundreds of languages to furnish child and adult data that bear on the issue of S- and V-framed languages. In the first

[8] I adopt the Hepburn system (*hebbon shiki*) of romanization for all Japanese examples.

major publication of these findings, Berman and Slobin (1994) describe how test subjects were shown a wordless children's picture-story book, entitled 'Frog, Where Are You?' (Mayer, 1969), and were asked to tell the story, creating their own narratives in their own languages. The storybook was selected for the rich variety of motion events depicted, and the plot may be summarized as follows: a pet frog escapes from its jar, and a little boy and his dog go in search of it, having several adventures on the way. Motion events include falling out of a window, climbing up and falling down from a tree, climbing a rock, being thrown by a deer over a cliff into some water, and scrambling out of the water and over a log, before the frog is finally found. In this pioneering set of studies, 'frog story' narratives were collected from five age groups (3yrs, 4yrs, 5yrs, 9yrs, adult) in two S-framed languages (English and German) and three V-framed languages (Hebrew, Spanish, and Turkish), providing over 250 texts for analysis.[9] An appendix to Berman and Slobin (1994) lists related frog-story studies in a further fifty languages, lending weight to these initial claims.

In comparing the English and Spanish frog stories, Slobin (1996) reports that the English narratives included 47 motion verbs, 37 of which were used with satellites (e.g. *climb+down*, *hop+in*, *run+after*). Many were used with more than one satellite (e.g. *climb+* {*down, on, out, over, up, up in, up on*}), resulting in 123 types. Needless to say, this study examines what the subjects actually said, not what they could have said, and the number of possible combinations of verbs and satellites greatly exceeds this figure. Several verbs can be used with more satellites than found in the study (e.g. *climb* may also combine with *across*, *along*, *through*, etc.), and several verbs not found with satellites do allow such combinations (e.g. *carry*, *follow*, *move*). Most English verbs conflated MOTION and MANNER, according to the expected pattern. In

[9] There were no 4-yr-olds in the German or Turkish studies.

stark contrast, the Spanish narratives exhibited only 27 verb types, the majority of which were 'basic motion verbs' (e.g. *bajarse*, 'go-down'; *entrar*, 'enter'; *regresar*, 'return'), with MANNER either omitted or in adjunct phrases.

Another interesting finding was the extent to which in all age groups the English narratives encode paths in explicit descriptions, leaving locations to be inferred, whilst the Spanish narratives give more explicit descriptions of locations, leaving the paths to be inferred. For example, the following utterances refer to a picture of a deer throwing a boy and a dog off a cliff into a river below. The English utterance, replete with path description, leaves one to infer that there is a cliff located above some water, whilst the Spanish counterpart provides a detailed static description, leaving one to infer the trajectory.

(1.14) He starts running and he tips him off over a cliff into the water. (age 9, USA)

(1.15) Los tiró a un precipicio donde había harta agua. Entonces se cayeron.
them threw LOC a cliff where there-was much water. then REFL fell
'He threw them at a cliff where there was lots of water. Then they fell.'
(age 7, Chile)

(from Slobin, 1996: 202, 204)

Slobin (1996) also reports related findings from a comparative investigation of English and Spanish literary texts, which corroborate the frog story results. Five English and five Spanish novels were chosen together with their translations. The original novels were opened at random, and read until a motion event appeared in the

text. Twenty such motion events were collected from each novel and their translations compared. The dichotomy between the encoding of path and location, found so clearly in the frog stories, was reaffirmed in the original English and Spanish novels, with detailed paths in English and detailed locations in Spanish. However, in an interesting twist, the *translations* reveal an asymmetry: the English translations almost always follow the original, 'and sometimes even add a bit' (Slobin, 1996: 210), whilst the Spanish translators are forced to make changes to English trajectories, omitting Manner and Path segments, as can be seen in the examples below.

(1.16) a. Original: He strolled across the room to the door.

b. Translation: Se dirigió hasta la puerta.
REFL directed until the door
'He went towards the door.'

(Du Maurier, 1938: 329, trans. 1959)

(1.17) a. Original: Se appoximó a la casa más cercana, que no tenía ninguna ventana y cuya puerta estaba abierta. Dejó sus maletas en la acera y entró.
REFL approached LOC the house most close that not had any window and whose door was open. left his suitcases on the sidewalk and entered

b. Translation: 'He approached the closest house, which had no window and whose door was open. He left his suitcases on the sidewalk and entered.'

(Allende, 1982: 49, trans. 1985)

The English translation makes use of the latinate borrowings 'approach' and 'enter', rather than e.g. '{walk / trudge / go} up to', or '{march / step / go} inside', none of which could be translated in reverse. This asymmetry raises the possibility that the grammars of English and Spanish are in a superset-subset relationship in this regard, with implications for any parameter-setting account of the acquisition of these languages; this question will be readdressed in Section 2.1.

As an important caveat to these earlier investigations, it has been generally recognized that when the event is 'atelic' or 'unbounded' (e.g. *towards*, *around*, *along*), in some V-framed languages the S-framed pattern becomes the norm (Aske, 1989; Slobin, 1996; Stringer, 2002a).[10] V-framed languages exhibit a constraint on 'MANNER V + bounded PP', but appear to allow 'MANNER V + unbounded PP'. The unbounded cases were generally treated as an exception to a robust generalization, and the general conclusion by the mid-1990s was that the S-framed / V-framed distinction is crosslinguistically valid. However, more recent studies have revealed further complications not so easily accommodated in a simple binary dichotomy.

1.5 Beyond the binary typology

The experiments reported in this study were conducted in a research climate where a reasonably clear-cut distinction between S-framed and V-framed languages went largely unquestioned. However, very recent work in the 'frog-story tradition', conducted at the same time as my own experimentation, corroborates the view taken in this thesis that whilst Talmy's binary typology remains useful as a broad generalization in comparing two specific languages, the devil is in the detail: as

[10] Boundedness in syntax is a very interesting phenomenon, but I leave it outside the scope of the current investigation, which takes [PATH] rather than [BOUNDARY] as the key selectional feature in explaining variation in the predication of direction (*contra* Stringer, 2002a, b).

previously formulated, it is too coarse-grained to capture the degree of variation within and across languages. In a follow-up volume to Berman and Slobin (1994), Strömqvist and Verhoeven (2004a) present an extension of this research with specific studies on American Sign Language, Arrernte, Basque, English, Hebrew, Icelandic, Japanese, Spanish, Swedish, Thai, Turkish, Tzeltal, Warlpiri and West Greenlandic, interspersed with references to research on many other languages. These two volumes are informally distinguished by Slobin (2004) and elsewhere in the literature as 'Frog I' and 'Frog II'. Two problematic issues highlighted in the Frog II research may be characterized as follows: (i) certain languages cannot be accurately described as either S-framed or V-framed, and (ii) there is no consensus about how best to revise the generalization: whether in terms of a typology (binary or ternary), or as a gradual cline from predominately S-framed to predominately V-framed.

First, let us examine the issue of elusive characterization. The Frog II study on Basque shows that whilst this language is characterized as V-framed because path is lexicalized in main verbs, it also expresses path by means of locative cases on nouns, and in over thirty postpositions that also take locative inflections (Ibarretxe-Antunaño, 2004). Morphology is used to build up complex paths in a way very similar to the elaboration of path satellites in S-framed languages. In addition, Basque allows verb-deletion, as shown in the following example:

(1.18) eta zas! sagu kanpora
and zas! mouse outside-ALLATIVE
'And suddenly, a mouse [comes] out.'

(Ibarretxe-Antunaño, 2004: 102)

Thus Basque is far from a typical 'V-framed language'. The Mayan language Tzeltal follows a similar pattern in that it too tends to lexicalize PATH in main verbs, but may elaborate the PATH with directional morphemes (on verbs in this case) with meanings corresponding to notions of 'up', 'down', 'in', out', etc. (Brown, 2004). Slobin (2004: 242) describes Tzeltal as a V-framed language with 'an S-language flavor'.

A recent, independent study of spatial terms in the Nepalese language Chantyal comes to similar conclusions, asserting that it 'fits the profile of a typical verb-framed language since core schemata (path and motion) are regularly mapped onto the main verb and supporting events (manner) are subordinated, usually as coverbs', yet there are very few path verbs and there are many 'directional satellites' and locative cases (Noonan, 2003: 27, summary notes 4 and 7). Speakers make frequent use of the latter, showing a bias towards descriptions of path rather than static locations, as seen in the following example.

(1.19) tâokhor n1/4 c1/4 naku jâyal-g1/4m ma-r t1/4 y-g1/4y mu
now TOP that dog window-ABL down-LOC fall-PROG be
'Now the dog is falling down from the window.'

It therefore appears that Chantyal is somewhat like Basque and Tzeltal in being a V-framed language with some S-framed characteristics.

Serial verb languages from language groups such as Sino-Tibetan, Tai-Kadai, Mon-Khmer, and Austronesian often express *both* manner and path as 'main verbs', as well as frequently adding a third, deictic motion verb (as we shall see, this is also an important characteristic of Japanese, a non-serializing language). Slobin

(2004: 228) reports that a typical Mandarin response to one frog story scene in which an owl flies out of a hole in a tree was as follows.

(1.20) fēi chū lái
fly exit come
'(It) comes flying out.'

Talmy (1985) originally characterized Mandarin as an S-framed language, with the MANNER verb as the primary predicate and the PATH verb as a kind of satellite, because PATH verbs appear to form a closed set which do not function as full verbs. However, these verbs can be used alone as the sole predicate in a clause (Gao, 2001); this means that they cannot be regarded as satellites, which by definition are verb particles and affixes that do not occur alone.[11] Moreover, young children exclusively use PATH verbs, only gradually adding MANNER information as they get older: 0% of 3-year-olds, 22% of 4-7-year-olds, and 73% of adults used MANNER verbs for the owl scene in the Chinese data (Slobin, 2004: 227). This makes Mandarin look more like a V-framed language. But it is also the case that Mandarin MANNER verbs occur with boundary-crossing events, which is characterisitic of S-framed languages. Serial-verb languages pose a range of similar problems. Recent research indicates that Thai (Zlatev and Yangklang, 2004) and Niger-Congo languages (Ameka and Essegbey, in press) share more properties with S-framed than with V-framed languages, while still retaining characteristics unique to serializing languages.

Other languages which cannot be easily classified include Hokan languages, which have 'bipartite verbs' consisting of two morphemes of equal status, one

[11] There is of course the possibility that these elements could realize more than one category, just as English *drive* can be V or N, and *inside* can be P or N.

expressing PATH and the other MANNER (DeLancey, 1989). In another syntactic variant which gives equal weight to PATH and MANNER, the Australian language Jaminjung encodes motion events with one of only five 'function verbs' expressing deixis or aspect ('go', 'come', 'fall', 'hit', 'do'), which are elaborated by 'preverbs' expressing PATH or MANNER (Schultze-Berndt, 2000).

This leads us to the second problematic issue: namely, how to step beyond the binary typology. In the most recent review of frog story research, Slobin (2004: 249) proposes a three-way typology, represented in the table below.

Table 1.3. *Slobin's (2004) ternary typology.*

V-framed languages	**S-framed languages**	**Equipollently-framed languages**	
Romance Semitic Turkic Basque Japanese Korean	Germanic Slavic Finno-Ugric	Serial V	(Niger-Congo, Hmong-Mien, Sino Tibetan, Tai-Kadai, Mon-Khmer, Austronesian)
		Bipartite V	(Algonquian, Athabaskan, Hokan, Klamath-Takelman)
		Jaminjungan	

The new category of 'equipollently-framed' languages subsumes the various language types in which PATH and MANNER are expressed by equivalent grammatical forms. However, a ternary typology still leaves unaddressed the problems raised by Basque, Tzeltal, and Chantyal (discussed above): placing them in any category seems less than satisfactory. In addition, certain V-framed languages also exhibit equipollently-framed behaviour. Japanese is generally considered a paradigm case of a V-framed language, but the common use of deictic verbs in Japanese with both PATH and MANNER in adjunct phrases (e.g. *Hashitte haitte kita* – running entering came – 'He came running in') makes it appear equipollently-framed in such cases.

Suggestions have been made that variation in the expression of both PATH and MANNER may be most accurately described in terms of gradients of elaboration from poor and infrequent lexicalization to rich and frequent lexicalization. Slobin (2004: 248) comments that 'rather than put languages into typolological categories, it might be more profitable to lay out the collection of factors that, together, interact to contribute to particular rhetorical styles', and goes on to propose a 'cline of manner salience' (ibid: 250). High MANNER-salient languages have a slot for manner which is easily 'accessible' (i.e. main V in S-languages, MANNER V in serial-verb languages, MANNER morpheme in bipartite verbs, MANNER preverbs in Jaminjungan languages, or ideophones (ibid: 250). To return to Slobin's (2004) example of the scene in which an owl flies out of a hole in a tree, we can exemplify the manner cline by taking a sample of languages and detailing the percentage of responses including a manner-of-motion verb:

Table 1.4. *Percentage of utterances with a MANNER verb used to describe the owls's departure in four languages* (adapted from Slobin, 2004: 225).

Spanish: 0% → Dutch: 17% → Mandarin: 40% → Russian: 100%

Russian exemplifies a Slavic lexicalization pattern which forces 100% expression of PATH in satellites. Unlike most S-framed languages, Slavic languages have no independent verb 'come'. Both DEIXIS and PATH must be expressed in a prefix to the MANNER verb. However, such prefixes cannot be stacked, so when the owl came flying out of the tree, Russian test subjects were forced to choose between the prefixes *pri-* ('come-') and *vy-* ('out-'): 11% chose the former, and 89% chose the latter. Examples of this type included *pri-letet* ('come-fly'), *vy-letet* ('out-fly'), *vy-skocit* ('out-jump'), and *vy-lezit* ('out-crawl').

As regards expression of PATH, Ibarretxe-Antuñano (2003) examines the degree to which complex PATHs are lexically encoded in four languages, and arrives at a proposal parallel to Slobin's (2004) MANNER cline, in arguing for a 'continuum' of PATH elaboration.

Table 1.5. *Cline of PATH elaboration across four languages (Ibarretxe-Antuñano, 2003).*

Thai → Spanish → Turkish → Basque

This proposal follows naturally from examination of the interaction in certain languages between 'basic' PATH verbs and extensive PATH morphology on verbs, adpositions and nouns, of the kind already discussed with reference to Basque, Tzeltal and Chantyal. Clines of salience are thus one way in which cognitive linguistic approaches to variation may step beyond the binary typology.

This thesis argues for an alternative approach to such crosslinguistic variation. The question of whether a binary or ternary typology is more or less descriptive than clines of salience is one I shall not pursue here. Rather than assigning typological descriptions of use, or arranging hierarchies in terms of lexicalization-type frequency, this thesis examines and compares what is possible or impossible in the grammars of English, French and Japanese in respect of path predication. The question of whether S-framed or V-framed constructions dominate given types of corpus data is replaced by the questions of what can and cannot be generated by particular-language grammars. Perhaps the best starting point for this shift in perspective is the resurrection of an old debate: namely, the issue of what can be gained by studying grammaticality rather than by calculating frequency of use.

1.6 From E-language to I-language

Chomsky (1986) maintains that the goal of generative grammar is to characterize the nature of the cognitive resources that constitute *knowledge of language*, rather than to account for how or why speakers choose to use such knowledge in particular contexts. To this end, the concept of language in the mind (a cognitive system able to generate an infinite number of grammatical sentences) should be held distinct from the concept of language as the externalized product of this mental capacity (a finite set of spoken utterances, writings etc.). Chomsky (1986: 19-46) argues this point at length, and refers to these two concepts as 'I-language' (which is 'internalized') and 'E-language' (which is 'externalized'). In these terms, the cognitive linguistic investigations reviewed above are all studies of E-language: they investigate how speakers put their native language to use in a given context (oral narratives), rather than what speakers know in respect of the possibilities and limitations of their grammar. Slobin (2004: 253) is quite clear on this point when he states that '…we can build upon [Talmy's] insights in working towards *typologies of language use*' [italics in the original]. The designs and conclusions speak to issues of preference rather than possibility, to narrative style rather than grammaticality. This approach is consciously adopted, and follows naturally from the way in which Talmy's (1985) lexicalization patterns were originally conceived. The criterion for typological classification of a language is that the language as a whole selects a category ('verb' or 'satellite') as its most *characteristic* expression of PATH. To be more specific, by characteristic lexicalization type Talmy (1985) means that:

> '(i) it is *colloquial* in style, rather than literary, stilted, etc.; (ii) it is *frequent* in occurrence in speech, rather than only occasional; (iii) it is

> *pervasive*, rather than limited, that is, a wide range of semantic notions are associated with this type'
>
> (Talmy, 1985: 62; italics in the original)

Thus in constructing a binary typology or cline of salience for the lexicalization of PATH and MANNER, what is or what is not grammatical in the language is not the main issue. What matters in such characterization is the tendency of the 'language as a whole' (or rather the tendencies in the utterances of representative speakers in a given context). As such, the frog stories are examples of narrative discourse reflecting not only the grammar but also 'the dynamics of cultural and aesthetic values and the perspectives and communicative aims of the speaker' (Slobin, 2004: 253).

It goes without saying that there are great benefits to understanding how we put language to use in certain situations (e.g. when we relate narratives, when we speak formally or informally, when we speak in a court of law etc.) and how we facilitate processing in communicative situations. Frequency of use of lexical items or syntactic constructions often plays a pivotal role in understanding discourse in such situations. The comparative studies of type-frequencies in Frog I and Frog II are highly relevant to the domains of stylistics, rhetoric and translation theory, and may well prove fruitful in other areas of applied linguistics, such as in computer systems for natural language processing. Mainstream computational linguistic analyses of corpus frequencies help to fine-tune a system's ability to mimic linguistic knowledge, and make possible probability calculations for things such as adjective-noun collocations, or attachment tendencies of phrase-types, or meanings of verb-particle combinations (for respective examples, see Evert and Kermes, 2003; Volk, 2003;

Villavicencio, 2003). The S-framed / V-framed distinction may have similar applications.

However, in order to discover the principles of mental grammar, and more generally to understand the nature of language in the mind, Chomsky (1986) maintains that I-language should be the focus of inquiry. To this end, the grammaticality of a sequence (i.e. whether it may or may not be generated by the system) is of more import than its frequency (i.e. how often it is generated). A natural language grammar has the capacity to generate an infinite number of grammatical sentences, yet simultaneously exclude an infinite number of ungrammatical combinations. It is this creative capacity, and the constraints inherent in this capacity, that generative linguistics seeks to explain. Chomsky has been explicit on this point since the inception of the generative enterprise.

> 'The fundamental aim in the linguistic analysis of a language L is to separate the *grammatical* sequences which are the sentences of L from the *ungrammatical* sentences which are not the sentences of L and to study the structure of the grammatical sequences. The grammar of L will thus be a device that generates all of the grammatical sequences of L and none of the ungrammatical ones.'
>
> (Chomsky, 1957: 13)

Despite the validity of statistical frequency as a tool in many areas of applied linguistics, its use in determining the nature of the grammar appears to be extremely limited. After all, the creative capacity that generative linguistics seeks to investigate

by its nature makes possible the formulation of novel and unfamiliar juxtapositions. Again, Chomsky's position on this point has always been clear.

> 'the notion 'grammatical in English' cannot be identified in any way with the notion of 'high order of statistical approximation to English'… […] …in the context 'I saw a fragile ____', the words 'whale' and 'of' may have equal frequency (i.e. zero) in the past linguistic experience of a speaker who will immediately recognize that one of these substitutions, but not the other, gives a grammatical sentence…. […] …statistical studies of language…appear to have no direct relevance to the problem of determining or characterizing the set of grammatical utterances.'[12]
>
> Chomsky (1957: 15-16)

The focus of the present inquiry is therefore in some sense narrower than the scope of the research reviewed above, leaving much outside the realm of its investigations: rhetorical style, cultural preferences, communicative gestures, and so on. Lexicalization types that are perhaps more 'atypical' in terms of the binary typology are just as important as more typical examples in determining principles of well-formedness, so characterizing the 'most typical means of expression' is also outside the scope of this project. With an emphasis on I-language rather than E-language, and grammaticality rather than frequency, this study is an attempt to account for variation in the *grammar* of PATH predication (what is possible and not possible) in English, French and Japanese, and to examine how children might come to acquire such

[12] This of course does not invalidate all corpus-based research, but rather sets limitations on the applications of such work. This point is well-taken by many computational linguists. For example, Pustejovsky (1995: 40) notes, 'We must always be cautious with what inferences we draw from corpus data. In this respect, the criticism of Chomsky (1955, 1957) is just as relevant today as it was in the 1950s.'

knowledge of their native language. In the following chapter, two possibilities are examined in respect of formalization of patterns in the predication of PATH. Firstly, we consider the construal of a formal lexicalization parameter that might explain the broad generalizations involved, as well as account for the types of exceptions discussed above. Secondly, we consider the abandonment of Talmy's typology as the basis of a formal account of this type of variation. If the same lexical types are found (with varying frequency) in each language, and if the same syntactic structures obtain in each language, the level of 'language-particular grammar' evaporates as a theoretical construct.

Chapter 2

Two paths to formalization

Several researchers have advanced the idea that Talmy's typology concerns more than 'characteristic expression', and might be stated in terms of either a formal principle or constraint operative at the whole-language level. As we have seen, in sentences analogous to ex. (1.11), repeated in condensed form below, neither French nor Japanese allows the equivalents of 'dance' to function as the main verb.

(2.1) Chihiro danced {into the house / up the stairs / across the street}.

Such facts have led Jackendoff (1990: 223-225) to suggest that non-directional motion verbs such as *wiggle*, *spin* and *bounce* are always underlyingly adjuncts in directed motion events, such that the semantic structure of *Chihiro danced into the house* may be paraphrased as *Chihiro went into the house by dancing*. On this account, English has a 'GO-Adjunct rule', which allows the expression of the semantic adjunct as the main syntactic predicate in a directed motion event. The reason for the resulting ungrammaticality when such English sentences are literally translated into French and Japanese is that these languages lack this rule (Jackendoff, 1990: 225). Other accounts which have sought to make the same distinction at the whole–language level include Levin and Rapoport's (1988) principle of 'lexical subordination', and Snyder's (1995) positing of a null telic morpheme in this type of English structure, linked to a more general 'compounding parameter'. However, very often it is simply assumed that some constraint is operational, and the validity of the distinction is taken as read (e.g. Inagaki, 2002; Randall, van Hout, Weissenborn and Baayen, 2004). Whilst previous

accounts have focused on verb-types or more general event semantics, they have often failed to take into consideration the fact that the semantics of adpositions is of equal importance in construing examples for crosslinguistic comparison. The fact that French and Japanese lack lexical equivalents of *into*, *up* and *across* goes a long way toward accounting for the failure of literal translation of the examples in (2.1). Indeed, if these English PPs are headed by locative prepositions such as *in (the house)*, *on (the stairs)*, or *underneath (the street)*, the meaning is strictly locational when they are merged with the verb *dance*. Alternatively, the expression of MANNER in the main predicate in French and Japanese does support directional interpretation in some cases, depending on the interplay of V and P, as will be shown unequivocally in the experiments to be discussed in Part II.

Within the generative framework, there are at least two general ways in which the lexicalization patterns in PATH predication identified by Talmy (1985) might be formalized. In the first case, if the typology stands up to scrutiny in terms of grammaticality rather than simply 'most characteristic expression', then this could be stated at the level of the whole language. For this approach to be valid, exceptions within a given language type must be subject to principled explanation. Alternatively, variation within languages may be such that any whole-language characterization is merely a statement of tendency. If these lexicalization patterns resist formalization at the whole-language level, an account is then required at the level of individual lexical items (LIs).[1] In this case, the details of crosslinguistic variation might be characterized in the same way as variation within a single language, in terms of the inherent properties and argument structure of LIs. These two possibilities may be expressed as follows.

[1] I follow Chomsky (2000b) in his use of the abbreviation LI for 'lexical item'. This term is here used to mean any individual entry in the mental lexicon: open and closed class items, free and bound morphemes, multimorphemic lexemes, and idioms.

(2.2) *Hypothesis I: The Path Parameter Hypothesis (PPH)*. A language must select either (i) V or (ii) P as the canonical predicate-type for the expression of PATH in motion events.

(2.3) *Hypothesis II: The Lexicalist Path Hypothesis (LPH)*. Variation in PATH predication, both across languages and within languages, is determined by inherent and contextual properties of LIs.[2]

Of these two hypotheses, the PPH most neatly fits in with mainstream tendencies in generative crosslinguistic research, which is predominantly parameter-based. In common with certain other parametric proposals, one interesting possibility is that several apparently disparate aspects of crosslinguistic variation may be related along a linguistic fault-line. Talmy (1991: 480) suggests that whether a 'verb' or 'satellite' is selected as host for the semantic element PATH is part of a wider 'setting', defining a broad swathe of variation in binary terms, as we shall see below. As such, this hypothesis merits serious consideration. However, it rests on the assumption that terms such as 'S-framed language' have theoretical status in crosslinguistic comparison, which is less than straightforward. In the following sections, the parametric approach to language variation is described, and we consider the possibility of its application to Talmy's lexicalization patterns. The focus then shifts to the second possibility, placing the phenomena of path predication in the more general lexical-syntactic realm of predicate-argument structure. The natural object of study from this second perspective is not the syntactic settings of the language, but the representations of lexical entries. If the lexicon proves to be the locus of variation, this

[2] There is always the possibility that classes of LIs have the same property in some language, which can be stated in terms of 'lexical redundancy rules'.

raises the possibility that the relevant syntactic principles in the predication of PATH might be constant across languages.

2.1 The Path Parameter Hypothesis

2.1.1 The Principles and Parameters model

If the PPH is adopted, then our approach to the acquisition issue may be informed by the theory of Principles and Parameters, henceforth P&P (Chomsky, 1981, 1986, 1995; Chomsky and Lasnik, 1993). The P&P model holds that a given principle of universal grammar may be instantiated with a strictly limited degree of variation. This constrained variation is expressed in terms of a parameter with two or more settings, allowing us to distinguish grammatical types *at the level of whole languages*: 'Ideally, we hope to find that complexes of properties differentiating otherwise similar languages are reducible to a single parameter, fixed in one or another way' (Chomsky, 1981: 6). As we shall see below, despite the fact that many researchers associate the setting of parameters with the acquisition of lexical items (Borer, 1984; Manzini and Wexler, 1987) or specifically functional items (Fukui, 1988; Ouhalla, 1991), this does not alter the fact that the most influential proposals for parameters are attempts to assign values at the whole-language level, as we shall see below. In the same way, perhaps the acquisition of certain verb and adposition types 'triggers' a knowledge of PATH predication, so that whether the language is S-framed or V-framed becomes part of the child's syntactic knowledge. As examples of this type of approach, let us briefly examine P&P proposals for three aspects of language variation: head-complement order, *wh*-movement, and null subjects. These three well-studied phenomena may each contribute something unique to our understanding of how a path parameter might be formulated.

2.1.2 Parameter-based accounts of language variation

The parameter-based approach to language variation has been applied with considerable success to many types of syntactic variation, but the 'head parameter' is perhaps the paradigm case of the formalization of typological patterns. In his pioneering study of word-order variation, Greenberg (1963) made the following observations:

Universal 3: Languages with dominant Subject-Verb-Object are always prepositional.

Universal 4: With overwhelmingly greater-than-chance frequency, languages with normal Subject-Object-Verb order are postpositional.

As shown below, English exemplifies Greenberg's (1963) Universal 3, whilst Japanese exemplifies Universal 4 (heads in italics).

(2.4) a. VP: *kill* Bill; *eat* cake

b. PP: *from* heaven; *at* work

(2.5) a. VP: Biru o *korosu*; o-kashi o *taberu*

Bill ACC kill; HON-cake ACC eat

'kill Bill'; 'eat cake'

b. PP: tengoku *kara*; shigoto *de*

heaven from; work at

'from heaven'; 'at work'

A broader range of related observations is made by Baker (2001), which he presents in the following table, contrasting English and Japanese:

Table 2.1. *Word order relationships in English and Japanese* (Baker, 2001: 60).

Element A	Element B	English Relation	Japanese Relation
Verb	Direct Object	A precedes B	A follows B
Verb	PP	A precedes B	A follows B
Verb	Embedded clause	A precedes B	A follows B
Pre/post-position	Related NP	A precedes B	A follows B
Noun	Related PP	A precedes B	A follows B
Complementizer	Embedded clause	A precedes B	A follows B
Auxiliary	Main V	A precedes B	A follows B

As Baker (2001) notes, the redundancy inherent in these seven generalizations is eliminated by the postulation of the 'head parameter', which subsumes them all. The principle is that heads and complements must be adjacent to each other in all languages (at some level of representation), but there are two parameter settings: some languages are 'head-initial', and some are 'head-final'.

Similarly, the '*wh*-movement parameter' has been argued to account for why some languages apparently require displacement of question phrases, whilst other languages allow such phrases to remain '*in situ*', i.e. in their underlying position (Huang, 1982). The principle in this case is that *wh*-phrases 'move' in all languages in order to take scope; the variation lies in whether this movement takes place 'overtly' (before pronunciation or 'Spellout'), or 'covertly' (at the level of Logical Form). This can again be illustrated with examples from English, which requires overt *wh*-movement, and Japanese, which requires *wh*-in-situ with covert movement.[3]

[3] Japanese does allow scrambling, but this is uncontroversially distinct from *wh*-movement.

(2.6) a. I know what Koji saw.

b. [$_{IP}$ I know [$_{CP}$ *what* [$_{IP}$ Koji saw ___]]]

overt movement

(2.7) a. boku ga Koji ga *nani*-o mita ka shitteiru koto
I-NOM Koji-NOM what-ACC saw Q know-ASP thing
'the fact that I know what Koji saw'

b. [$_{IP}$ boku ga [$_{CP}$ ___ [$_{IP}$ Koji ga *nani*-o mita] ka] shitteiru]

covert movement

Other parameters that have attracted considerable interest include those which attempt to distinguish (i) languages that require overt subjects in finite clauses from (ii) languages that allow 'null' (i.e. unpronounced) subjects. The principle in this case is that all finite clauses have subjects, but some languages allow these to be unpronounced, along two lines of parametric variation. Early attempts to characterize null subjects highlighted the role of inflection: the dropping of pronouns is common in languages with rich paradigms of subject-verb agreement, where the subject is somehow still visible in agreement morphology on the verb (Italian: *giocc<u>o</u>*, *giocch<u>i</u>*, *giocc<u>a</u>* etc. – '*I* play, *you* play, *he/she/it* plays etc.). The 'pro-drop parameter' has been claimed to operate in such languages (Chomsky, 1981; Borer, 1984; Hyams, 1986). The contrast is seen below in these English and Italian examples.

(2.8) a. *(I) play tennis.

b. Chicca knows that *(I) play tennis.

(2.9) a. *pro* giocco al tennis

pro play-1SG at-the tennis

'I play tennis.'

b. Chicca sa che *pro* giocco al tennis

Chicca knows that *pro* play-1SG at-the tennis

'Chicca knows that I play tennis.'

In Hyams' (1986) seminal account relating null subjects in child English to pro-drop in adult Romance, the licensing of null subjects is tied to several other linguistic phenomena: rich agreement, post-verbal subjects, and the lack of expletive subjects (following observations by Rizzi, 1982). In an alternative conception, the fact that languages with no subject-verb agreement morphology whatsoever also appear to allow null subjects led Jaeggli and Safir (1989) to propose the 'morphological uniformity hypothesis': a language allows null subjects only if *all or none* of the finite verb-forms show agreement. However, the empty subjects of East Asian languages are now generally considered to be of a different ilk, in that they are not linked to agreement systems at all. Following the distinction made by Tsao (1977) between 'discourse-oriented' and 'sentence-oriented' phenomena, Huang (1984) proposed a second type of parametric variation in this regard: what is dropped in East Asian languages is the topic, rather than the subject, an observation which is formalized in terms of the 'zero topic parameter'. Such languages grammatically distinguish between the subject of a clause and the topic of the discourse. In Japanese, subjects are case-marked with the particle *ga*, whilst topics are marked with *wa*. Although the topic of the discourse often corresponds to a syntactic subject, it can also be the syntactic object, or even an adjunct expressing place or time, as shown below.

(2.10) Ken wa kono omiyage o Tokyo de katta.

Ken TOP this souvenir ACC Tokyo P_{PLACE} bought

'Ken bought this souvenir in Tokyo. / As for Ken, he bought this souvenir in Tokyo.'

(2.11) Kono omiyage wa Ken ga Tokyo de katta.

this souvenir TOP Ken NOM Tokyo P_{PLACE} bought

'Ken bought this souvenir in Tokyo. / As for this souvenir, Ken bought it in Tokyo.'

(2.12) Tokyo de wa Ken ga kono omiyage o katta.

Tokyo P_{PLACE} TOP Ken NOM this souvenir ACC bought

'Ken bought this souvenir in Tokyo. / As for Tokyo, Ken bought this souvenir there.'

Once introduced as the topic, the element can be dropped from ensuing discourse, whether it be a subject, an object or an adjunct: hence 'topic-drop', rather than 'pro-drop'.[4] As long as an element has been discourse-linked, it may be dropped, leading to multiple topic drop in some cases.[5]

[4] For recent debate on the nature of pro-drop and null topics, see e.g. Guasti (2002); Yang (2002); Zushi (2003).

[5] It is occasionally argued that there may be only one topic in a Japanese sentence (e.g. Kuno, 1973), and therefore multiple topic drop is impossible. However, Kuroda (1992: 350) gives evidence of overt multiple topics, e.g.

(i) Paris de wa Masao wa Eiffel too to Notre Dame no too ni nobotta.
Paris P_{LOC} TOP Masao TOP Eiffel tower and Notre Dame tower ACC climbed
'In Paris, Masao climbed up the Eiffel Tower and Notre Dame.'

It is uncontroversial that in cases where both subject and object are missing, they must be established discourse referents. Therefore I believe it is reasonable to assume that such cases are instances of multiple topic drop.

(2.13) Tokyo de katta.

Tokyo P_{PLACE} bought

'{I / You, He, etc.} bought {it / them} in Tokyo.' (literally: 'bought in Tokyo')

Thus the phenomenon of null subjects across languages can be explained in terms of two independent parameters, specifying positive or negative values for pro-drop and null topics. Despite continuing debate over the nature of parameters, how exceptions may be accounted for, and what might count as evidence for children to select a particular setting, proposals such as the head parameter, the *wh*-movement parameter, the pro-drop parameter and the topic-drop parameter are considered as showcase examples of Chomsky's (1981) approach to language variation. In line with this type of formalization process, the S-framed / V-framed distinction might be cast in terms of a lexicalization parameter, with a binary setting (or building on Slobin's 2004 analysis, a ternary setting).

An interesting possibility to be explored within this approach is that PATH lexicalization may be part of a larger parameter setting, grouping together several apparently disparate linguistic phenomena. If Talmy's (1991, 2000b) hypothesis is accurate, this parameter would cut across several semantic domains in an intriguing way, subsuming PATH in motion events, ASPECT in temporal contouring, PROPERTY in events of state change, CORRELATION in events with multiple participants, and FULFILLMENT in events of 'realization'. Respective English examples are given below.

(2.14) a. Fred ran out. (PATH in motion events)

b. Fred drove on. (ASPECT in temporal contouring)

c. Fred faded away. (PROPERTY in events of state change)

d. Fred and I sang together. (CORRELATION in events with multiple participants)

e. Fred ate his dinner up. (FULFILLMENT in events of 'realization')

In each case, the 'schematic core of the framing event' is lexicalized as verb or a satellite according to the typological setting of the language (Talmy, 1991: 480; 2000b: 214). That these semantic elements are all conflated in satellites in English is because the language 'as a whole' is characterized as satellite-framed.[6] In this thesis, I shall restrict discussion to PATH in motion events. Talmy's (1991; 2000b) wider generalization on the subject of 'event integration' spread from the assumption that the typology of PATH in motion events was a sound generalization; however, it is precisely this aspect of crosslinguistic variation that forms the current focus of my questions.

It is important to note that exceptions in a single language do not necessarily invalidate the P&P approach, as long as an explanatory account can be given for such exceptions. We know in advance that Talmy's typology admits exceptions (e.g. English: *cross the street*; French: *courir à la gare* – 'run P_{LOC} the station – 'run to the station'; Japanese: *umi ni jampu suru* – sea P_{LOC} jump do – 'jump in the sea'), but in fact all three 'paradigm' applications of P&P theorizing discussed above allow exceptions in one way or another. For example, the head parameter is still generally assumed to be set for whole languages even though we can find cases in which certain categories or even lexical items select in opposite directions in a particular language (see below, Section 2.2.1). Similarly, French apparently refrains from choosing a

[6] In an independent attempt to relate PATH lexicalization patterns to other linguistic phenomena, Snyder (1995) argues that languages that do not allow MANNER verbs to merge with GOAL PPs also do not allow these verbs to participate in resultative constructions. Again, the idea is that the language as a whole can be described as having a single syntax in PATH constructions, across all classes of MANNER verbs and all classes of locational adposition.

language-wide setting for the *wh*-parameter, allowing either *wh*-movement or *wh*-in-situ, other than in indirect questions, where movement is obligatory. Although English does generally require *wh*-movement, *wh*-words remain *in situ* in echo questions ('I bought a boat.' 'Bought a what? You bought a *what*?') and multiple *wh*-questions ('Who did Mary see where?'). Null subject principles appear to be less violable, but even here there are systematic exceptions in diary-writing, email and text-messaging (e.g. 'Got the message. Meet you tomorrow at two. Will bring my sandwiches.'). Such findings do not force us to immediately abandon the parameter-based approach, as they are generally seen as violations of general principles whose validity is based on how much they can explain, rather than the limited patterns they do not cover. In the same vein, if the existence and use of counter-example lexicalization types, such as English PATH verbs (e.g. *ascend*, *cross*, *enter*), can be systematically accounted for, then the PPH can remain a plausible and appealing proposition. As regards the acquisition of such knowledge, parameterization theory brings with it a cluster of questions regarding how children converge on the specifications of the adult grammar.

2.1.3 Acquisition as parameter setting

In the examples of syntactic variation discussed in the preceding section, language acquisition is seen as a parametric choice between two or more variants of a universal principle, as a child's mind interacts with the available linguistic input. From this perspective, several interrelated questions arise, concerning the age at which parameter-setting takes place, whether parameter-setting is instantaneous or gradual, what the child might require of the input in order to set the parameter, and what happens before the parameter is set (i.e. is there a default setting, do they allow both types, or are they always accurate on first production?). A brief examination of

acquisition findings in respect of word order, *wh*-movement, and null subjects reveals points of consensus and disagreement in generative research with regard to the above questions.

2.1.3.1 Acquisition of the head parameter

At least some aspects of parametric grammar appear to be fixed very early in development. The particular setting of the head parameter is respected from the beginning of children's multi-word utterances, as observed by L. Bloom (1970), Brown (1973), and in many subsequent studies. Children acquiring English and French at the two-word stage know that their language is VO, whilst children acquiring Japanese at the same stage know that their language is OV. More recent experimentation has been used to argue that children understand word order even at the one-word stage of production. Hirsh-Pasek and Golinkoff (1996) describe an experiment using the 'preferential looking paradigm' (Naigles, 1990), in which 17-month-old children were placed before two television screens, showing video images of actions involving two characters, A and B. On one screen, A performed an action on B, and on the other screen, B performed an action on A. Children heard an utterance from a loudspeaker, such as '*Big Bird is washing Cookie Monster*', or '*Cookie Monster is washing Big Bird*', and their eye movements were recorded. It was found that children's gazes accurately matched the overheard utterance and the appropriate video scene. Some interpret this result as evidence that these children understand VO-structure, indicating the very early setting of the head parameter (e.g. Guasti, 2002:102-3). However, on reflection this does not quite stand up to scrutiny, as perhaps children were showing recognition of the subject as the agentive participant. Hypothetically, it would be unsurprising if sentences like '*Big Bird is*

washing Cookie Monster' and '*Big Bird Cookie Monster is washing*' produced the same preferential gaze response. Nevertheless, despite the ambiguity of these particular results, it is clear that children are sensitive to word order even at the one-word stage, and given the almost total absence of word-order errors as they enter the two-word stage, one must conclude that the head parameter is set very early.

2.1.3.2 Acquisition of the *wh*-movement parameter

Similar conclusions hold for the *wh*-movement parameter. Guasti (2000) found that of 2,809 questions with *wh*-words in the speech of English-acquiring children aged between 1;6 and 5;1, 99% of instances involved movement. The remaining 1% could be accounted for in terms of their being 'echo questions', which do not require movement in any case. Very early obligatory *wh*-movement has also been attested in other languages such as Dutch (Haegeman, 1995) and German (Clahsen, Kurasawe and Penke, 1995). Conversely, Japanese children always leave *wh*-words in situ, so that the child grammar and adult grammar appear to be one and the same in this respect (Clancy, 1985). Adult French differs from 'English-type' languages and 'Japanese-type' languages in that it generally allows either movement or *wh*-in-situ in direct questions. This raises the interesting possibility that French children might at first choose one 'default' setting, and only later permit both forms, but in actual fact French children show no evidence of a default setting. In keeping with the adult grammar, they produce both types of utterances from the earliest stages (Hamann, 2000), which again points to early acquisition of parametric grammar.

Findings such as these have led to the proposal that certain 'basic' parameters are already set by the first observable stages of language acquisition, a hypothesis known as VEPS (Very Early Parameter-Setting) (Wexler, 1998). However, other

areas of language development are more problematic for this approach, such as the acquisition of syntactic principles relating to null subjects.

2.1.3.3 Acquisition of the null subject and null topic parameters

As is well-known, children acquiring languages that require overt subjects (e.g. Danish, Dutch, English, French, German) permit subjectless sentences until about 3 or 4 years old, producing utterances such as the following hypothetical English and French examples, which are ungrammatical in the adult language.

(2.15) a. get teddy

b. drink some water

(2.16) a. prend(s) nounours

take teddy

'{I/you/he/she/it} get(s) teddy.'

b. boi(s) de l'eau

drink P the-water

'{I/you/he/she/it} drink(s) some water.'

The first influential P&P account of such null subjects in child language was set out by Hyams (1986), who argued that the positive value of the pro-drop parameter was the default setting, so that English and Italian children start out with the same syntax in this respect. English-acquiring children thus 'reset the switch' at about 3 or 4 years old, once they integrate expletive pronouns (which are particular to non-pro-drop languages) into their syntactic system. The question of how the reference of these

early null subjects was determined remained a problem, however, given the lack of agreement on English verbs, which led Hyams (1992) to alter her proposal. The revised claim was that subject reference is discourse-linked, so that English children start out with a positive setting of the topic-drop parameter (in other words, English children start out with Chinese grammar rather than Italian grammar in this respect).

However, in the 1990s several differences were uncovered between these early null subjects / topics and those in both varieties of adult language, indicating that a simple 'parameter-switching' account was unlikely. For example, Valian (1991) claimed that in the following environments, null subjects are licensed in pro-drop languages, but are apparently impossible in child English: (i) questions with a fronted *wh*-element[7]; (ii) subordinate clauses; and (iii) matrix clauses with a fronted NP other than the subject. That Italian children allow pro-drop in these environments whilst English children do not indicates that they do not share the same grammatical principles. As regards null topics, a mis-setting of this parameter ought to result in child English and child Chinese having comparable proportions of subject-drop and object drop but most comparative research has found marked differences in the rates of subject- and object-drop in the speech of children acquiring English on the one hand, and topic-drop languages such as Chinese (e.g. Wang, Lillo-Martin, Best, and Levitt, 1992; Hyams and Wexler, 1993) and K'iche' (Pye, 1992) on the other. A topic-drop setting for English children can only be maintained if the relative ratio of null objects to null objects is reasonably constant across Chinese and English children in the same age group.

[7] The first claim about the lack of early null subjects in (i) questions with a fronted wh-element has since been disproved: Roeper and Rohrbacher (1994) and Bromberg and Wexler (1995) did find such utterances. However, the difference between languages appears to hold for the other syntactic environments.

Against the grain of these findings, Yang (2002) claims that on closer analysis the ratio of subject-drop to object-drop is the same in both English and Chinese child data.[8] This allows him not only to posit that English and Chinese child grammar both exhibit topic drop, but also to formulate an interesting variation on the parameter-setting model. In contrast to the 'parameter switch' metaphor, in which there is either a default setting or a lack of initial settings, in Yang's (2002) model all parameter values are present from the earliest stages and are in competition. Thus English-acquiring children start out with English, Italian and Chinese parametric values equally available. They may rapidly eliminate pro-drop as an option due to the lack of systematic subject-verb agreement in the input, but pass through a period when the 'English' and 'Chinese' grammars vie for unique instantiation. Elimination of topic-drop takes more time, due to the scarcity of the relevant evidence (expletive subjects) in the input. This approach has the advantage of correctly predicting that changes in parameter-based grammar in children are not instantaneous (e.g. null subjects show a gradual decrease in proportion over time).[9] However, the bulk of previous findings on the relative lack of object-drop in child English have led many to adopt a non-parameter-based account of early null subjects, such as the Agreement-Tense Omission Model (ATOM) (Schütze and Wexler, 1996; Wexler 1998), or the 'truncation' model (Rizzi, 1993/4), both of which fall outside the scope of the current investigation.

[8] Yang's (2002) findings contradict previous research. For example, Wang et al. (1992) report rates of subject and object omission by Chinese children as respectively 46.54% and 22.53%, and those by English children as 33.11% and 3.75%; on the other hand, Yang (2002) reports the respective ratios of null objects in his study as being very close: 36.2% in child Chinese and 32.1% in child English. Clearly, further investigation is required on this point.

[9] Sugisaki (2005) argues that whilst Yang's (2002) proposal predicts that other competing parameter settings should be in evidence in child language, this is not the case for another presumed parameter, concerning P-stranding. Following Yang (2002) both P-stranding / pied-piping should be available in English child language, but Sugisaki and Snyder's (2003) analysis of early P-stranding reveals that pied-piping is not attested at all.

2.1.3.4 Predictions for a parameter-based account of PATH predication

The above discussion makes it apparent that if the acquisition of knowledge of S-framed or V-framed syntax is to be explained in terms of P&P, it is plausible to expect one of several developmental scenarios. First, in keeping with a straightforward notion of VEPS, the path parameter might be set very early, so that early instances of path predication are relatively error-free. Thus French and Japanese children might never produce verb phrases equivalent to *dance into the room* or *wriggle into the hole*, always preferring to express PATH in a primary predicate such as 'enter'. On the other hand, if such primary predicates are a formal-register appendage to English grammar, one might expect never to find them in child language. Second, one parameter setting might be a default, so that all children start out with, say, S-framed syntax, with the other group of learners having to reset the parameter. Indeed, prior to this investigation I had observed the spontaneous production by children of French sentences such as *Il a couru dans la salle* – he AUX ran in the room - 'He ran into the room', and Japanese sentences such as *Gakko ni hashitta* – school P_{LOC} ran – 'He ran to school', both constructions of the opposite lexicalization type, which French and Japanese grammarians tend to frown upon. These observations were supported by anectdotal evidence from various sources in the 1980s and 1990s, indicating that child speakers of V-framed languages allow S-framed constructions.

> 'Although there has been no systematic study of how young children acquiring a Romance language begin to express motion, direction and manner, some observations suggest that children acquiring Spanish seem to begin by trying to combine motion and manner in the verb and expressing direction with a locative adverb...'
>
> Clark (1985: 746-747)

During the course of this study, such utterances will prove to be pivotal in the understanding of path predication across languages, and an attempt will be made to clarify their grammatical status. A third possibility within the parameter-based approach is that in the early stages, all children allow both S-framed and V-framed grammar, over and above whatever exceptions may be tolerated by the adult languages. As in the 'parameter competition model', rather than a particular child language reflecting a 'unique potential adult language', perhaps it reflects a 'collection of potential adult languages' with contradictory parameter-settings active and vying for prominence (Yang, 2002: 12).

Given the variety of plausible scenarios that can be accommodated within the P&P approach, one is forced to ask what it would take for this study of English, French and Japanese to rule out a parameter-based account. As shown by the resilience of P&P proposals in the face of mounting contradictory evidence in areas such as early null subjects in English, it is difficult to establish criteria according to which a P&P proposal would be deemed an impossible explanation by empirical developmental criteria. However, there are certain theoretical considerations and types of acquisitional evidence that could render the PPH plausible or implausible as an explanation of lexicalization patterns.

(i) If for each language there is in fact an overwhelming S-framed or V-framed construal of event structure, with only isolated exceptions, then the PPH remains plausible. However, if variation *in a single language* is such that it not tenable to describe that entire language as S-framed or V-framed, then the parametric approach falters in respect of that language, and therefore in respect of the possibility of its universal application.

(ii) If internal variation exists to some small degree in only one language, this may possibility be explained by a language-specific account.[10] However, if *all three languages* admit internal variation (to any degree), it becomes less tenable to distinguish between particular-language grammars on the basis of a simple binary parameter.

(iii) If PATH–verb syntax is uniform across languages, then a supra-lexical account is more easily justified. However, if the syntactically relevant lexical properties of 'equivalent' predicates in different languages prove to be different in crucial respects, then it is difficult to talk about a homogenous set of PATH verbs, with PATH–verb syntax (and the same, *mutatis mutandis*, for satellites), creating complications for formalization in terms of a parameter.[11]

(iv) If children show a demonstrable shift to language-particular syntax at a certain point in development, or if PATH predicate-argument structure appears to be in place from the outset, this would be supportive of a P&P account. If on the other hand children in the three language groups acquire the appropriate syntactic properties of PATH predicates not as a whole but piecemeal, verb by verb or adposition by adposition, this would indicate a fundamentally lexical process of acquisition.

[10] Perhaps in terms of lexical borrowings, in the case of English, *ente*r, *exit*, *ascend*, *descend* etc.
[11] For example, English *enter* requires a direct object and cannot merge with a locative P, whilst French *entrer* 'enter' requires a specific locative P *dans* 'in' and cannot be merged with a direct object. In the English case, the trajectory of the FIGURE is specified in V, but in French, a V^P combination is required. The question is whether this is just an odd case, or whether such variation in PATH verb syntax is endemic.

(v) Finally, if it is the case that, in general, the syntax of motion events varies by language type, this would support a parametric account. However, if all variation is somehow lexically determined, leaving a residue of common grammatical structures, this would favour an approach in terms of universal rather than parameterized syntax.

Previous research does not indicate whether or not a path parameter approach is feasible, nor how or when the parameter might be set by children, because as discussed earlier, grammaticality *per se* has never been a focus of investigation. The Frog Story research programme has compared lexicalization tendencies in children and adults: such comparisons were especially a feature of Frog I. For example, on being presented with the picture of the boy and his dog falling into some water, a difference was found between English and Spanish across age groups in their use of bare verbs (e.g. 'they fell') versus elaboration of PATH by means of prepositional phrases or adverbial expressions (e.g. 'they fell {down /into the water / over the cliff into the pond}'), as shown below.

Table 2.2. *Percentages of downward motion descriptions with bare verbs* (Slobin, 1996: 200).

	Preschool (3-5 yrs)	School (9yrs)	Adult
English	16	13	15
Spanish	56	54	36

Such statistics, whilst perhaps suggestive of the proposition that language-particular patterns of usage are established early in development, in fact tell us nothing about what is grammatical or ungrammatical in child and adult language. The 84% of English preschoolers who *did* elaborate the path description presumably could have

chosen not to do so. Conversely, the 56% of Spanish preschoolers who used a bare verb presumably could have added prepositional phrases or adverbial expressions if they had seen fit, just like the other 44% in the same group. These figures address tendencies of usage rather than grammaticality, and leave the parameter question untouched. The question of whether a P&P approach to path predication meets the criteria of either descriptive adequacy or explanatory adequacy will be tackled after discussion of two original acquisition experiments in the second part of this thesis. At this point, let us turn to the second approach to formalization, the Lexicalist Path Hypothesis, which abandons whole-language typology in favour of the formalization of PATH principles at the lexical level.

2.2 The Lexicalist Path Hypothesis

2.2.1 From whole-language to lexical item

In eschewing a whole-language analysis, the LPH may seem initially less attractive, both from the perspective of crosslinguistic research and from the perspective of acquisition. Narrow typologies introduce a kind of mathematical beauty to the patterning of differences across languages, and, as noted earlier, introduce a welcome simplification of the acquisition task of any given human child faced with any given human language. However, the lexicalist approach has its own formal simplicity. The more variation is accounted for in the representations of lexical items (LIs), which must all be learned in any case, the more syntax appears to be governed by regularities that cross language boundaries. Rather than forcing us to lose sight of questions of universality and the limits of variation, the LPH raises the possibility that the principles of syntax guiding the expression of motion events may be truly universal, with no parametric variation. In Section 2.2.2, a distinction is made

between 'lexical parameterization' accounts within the P&P model which remain, by and large, oriented to characterization at the whole-language level, and the rather different type of lexical approach considered here, oriented to specific representations of LIs. Possible routes to formalization are then considered. In Section 2.2.3, questions of acquisition are raised from this alternative lexicalist perspective, and the predictions of the LPH are set out.

2.2.2 Toward a lexicalist account of path predication

There are at least two very different ways of taking a lexical approach to crosslinguistic syntactic variation, and it is important to distinguish them from the outset. First, as noted above, one influential current of recent research stresses the idea that whole-language parameter-setting is intimately bound up with the acquisition of key features on lexical items; whilst an alternative approach is to view variation within and between languages as of the same ilk, dependent on the inherent and contextual feature specifications of individual LIs. The subsections below summarize these in turn, and describe the kind of lexical formalism required by the latter.

2.2.2.1 Two lexicalist perspectives on language variation

Lexical parameterization as a variant of the P&P approach has its origins in Borer (1984), and has been developed in work by Fukui and Speas (1986), Manzini and Wexler (1987), Fukui (1988), Ouhalla (1991), Chomsky (1995) and others. One of the key motivations for this approach is that whilst aspects of syntax may be innate, at least certain aspects of the LIs of a language must be learned on a case-by case basis, so it is plausible that syntactic variation could be 'piggybacked' on the task of lexical acquisition. A growing baby has no way of knowing in advance that desire for food or

toys or cuddles may be expressed using the English verb *want*, the French verb *vouloir*, or the Japanese verbal suffix *–tai*, nor what language-particular syntax may be in evidence from these LIs in syntactic contexts. As the language-particular lexicon must be learned, it is theoretically attractive to see the lexicon as a conduit for the instantiation of language-particular syntax. Manzini and Wexler (1987: 424) state the most general version of this hypothesis as follows:

(2.17) *Lexical Parameterization Hypothesis*: Values of a parameter are associated not with particular grammars but with particular lexical items.[12]

In its strongest form, this has been taken to imply that outside the lexicon, there is only one human language. An underlying universal syntax is thus superficially obscured by lexical idiosyncrasies. Fukui (1988), however, argues that this is perhaps too strong, and that some aspects of syntactic variation, such as ordering restrictions, must be extra-lexical. He goes on to propose a more restrictive version of the lexicalist approach, known as the 'functional parameterization hypothesis'. Dividing a 'universal lexicon' into functional categories with the feature [+F] (C, AGR, T, etc.), and lexical categories with the feature [-F] (N, V, A, etc.), he formulates his revision as follows (Fukui, 1995: 337).

(2.18) Only [+F] elements in the lexicon are subject to parametric variation.

[12] Another interesting variation on this idea is found in the work of Juffs (1996, 2000), who argues that values of certain types of parameter may be associated with *classes* of lexical items. For example, concepts of causation and change-of-state many be conflated in a single verb root in English, in the case of GROUND-oriented locatives (e.g. *cover*), causative unaccusatives (e.g. *melt*), and stimulus psych verbs (e.g. *convince*) (Juffs, 2000: 203). A language such Chinese, which cannot conflate causation and change-of-state in a single morpheme, lacks all these verb classes and must express such concepts with verbal morphology. Again, this type of analysis strives to provide an account for differences between languages, seeking to identify constraints at the whole-language level.

A corollary that follows from this position is that open-class lexical items must be essentially equivalent across languages:

> 'Under the functional parameterization hypothesis, then, parametric variation in the lexicon is restricted to how properties of functional elements are realized in particular languages, with substantive elements (lexical categories) drawn from essentially the same universal vocabulary across languages, apart from some limited variety in their choice.'[13]

(Fukui, 1995: 338)

The lexical approach to parametric variation has been applied with relative success to several aspects of syntactic variation (see Ouhalla, 1991, for discussion). However, the major problem with this approach is self-evident: language-wide parameter settings are by nature parsimonious: in cases that really do seem to apply across the language, a given principle need be stated only once in mental grammar, and does not need to be repeated *ad infinitum* in lexical entries. Unwelcome redundancy seems to be inherent in the lexical approach. Perhaps the most seemingly difficult case is that of the head parameter. As Baker (2001: 80) notes, there are no known languages in which the verb meaning 'hit' precedes the object as in English, and the verb meaning 'kiss' follows the object as in Japanese. The orders VO and OV must be set during the process of learning verbs as a syntactic category, rather than as individual predicates. Nevertheless, even with the head parameter, it appears some scope must be allowed for categorial and perhaps even lexical idiosyncrasy. Whilst

[13] This notion of a 'Universal Lexicon' will be considered and rejected in the following chapter. Equivalence is shown to be highly elusive in both the open and closed-class lexicons.

English and Japanese appear to be good examples of uniform head-initial and head-final languages, it has been argued that German is a mixed order language, with V and I selecting to the left, and C, N, A and P selecting to the right (Ouhalla, 1999). In a recent study of the language Nupe, head-complement directionality has been shown to vary even within a single category, as one complementizer (*o* – 'that') selects to the left and another (*gànán* – 'that') selects to the right (Zepter, 2000, reported in Baker, 2001).

Despite this trend in parametric research, most work in the P&P framework does still attempt to characterize binary or ternary settings of parameters applied at the level of whole languages. Whilst the setting of the *wh*-movement parameter may be linked to the acquisition of *wh*-words (and any feature-values they may bear), overt or covert *wh*-movement remains a language-particular characteristic. This whole-language emphasis may be found in every item on the following list of ten other well-known parameters, culled from Baker's (2001) introductory overview of P&P theory: (i) the adjective neutralization parameter; (ii) the ergative case parameter; (iii) the head parameter; (iv) the null subject parameter; (v) the polysynthesis parameter; (vi) the reflexive domain parameter; (vii) the serial verb parameter; (viii) the subject placement parameter; (ix) the topic-prominent parameter; and (x) the verb-raising parameter.

A particularly strong exception to this exclusively binary or ternary approach to syntactic variation is found in Emonds (2000). Following in the tradition of work on 'functional parameterization' discussed above, Emonds (2000: 114) maintains that 'language-particular syntax resides entirely in…the inherent and contextual feature combinations associated with closed class items.' Thus the lexical specifications of functional items in the lexicon themselves constitute the class of language-particular

parameters. Where this hypothesis most departs from 'classical' P&P theory lies in the dramatic increase in the number of proposed parameters and the variations in their settings. Emonds' rhetorical reply to this runs as follows.

> 'One might object that this constitutes 'too large a number of parameters', but this is a terminological issue in the absence of any serious arguments as to the form of lexical entries. Future work on the grammatical lexicon may or may not reveal that grammatical elements of particular languages have exactly the same specifications. However, in the twenty years of the Principles and Parameters model, I cannot think of a single English grammatical morpheme that plausibly should be assigned the same lexical specification as its closest counterpart in French or Japanese.'
>
> (Emonds, 2000: 115, fn.4)

As we shall see, the findings of this investigation basically agree with these observations, but the issue of the size of the parameter inventory is perhaps not just terminological. Standard P&P proposals do restrict the scope of variation, in line with Chomsky's (1981: 3) original conception of UG being 'based on a number of fundamental principles…with parameters that have to be fixed by experience.' Baker (2001: 23) chooses similar terminology when he suggests that 'all languages are combinations of a finite number of basic parameters'. These notions of 'fundamental principles' and 'basic parameters' are not intended to capture the eccentric behaviour of functional items such as English *of*, French *de*, or Japanese *no*. The kind of variation we see in lexical items cannot be reduced to binary or ternary variations on

universal principles. It is thus unsurprising that not a single parameter since the inception of the P&P model really addresses the 'highly language-specific nature of individual grammatical morphemes' (Emonds, 2000: 115, fn.4). Whilst Emonds' (2000) detailed research on LIs is clearly a development of functional parameterization theory, his approach is distinct from standard parameter theory, and in line with the perspective underlying the LPH. Whilst the functional parameterization hypothesis may well be correct in claiming that any language-wide parametric differences are all linked to functional categories, the semantic and syntactic differences between supposed equivalents, for example, (i) grammatical prepositions such as *of*, *de* and *no*, (ii) PATH verbs such as *enter*, *entrer* and *hairu*, or (iii) MANNER verbs such as *jump*, *sauter* and *tobu*, are really differences between LIs, not differences between languages.

The lexicalist approach to P&P theory shares with the LPH the idea that the lexicon is the locus of syntactic variation, but differs from it in three important ways. First, as we have seen, most if not all proposed parameters are intended to characterize whole languages, whilst the LPH allows for a broad range of variation within a single language. It carries no assumptions as to the frequency of a particular type in a particular language. On this hypothesis, characterization of the language as 'S-framed' or V-framed' is a statement of tendency, rather than a formal description.

Second, unlike functional parameterization approaches, it makes no distinction between whether grammatically relevant semantic features are carried on open or closed class items. Functional parameterization is an intriguing idea with a degree of empirical support in the literature, but it has no obvious relevance to the kind of variation under investigation. Differences in types of predicate-argument structure cannot be stated simply in terms of the closed-class lexicon. The interplay of semantic

features in directional syntax involves not only elements that are generally considered 'functional' (e.g. *to*, *of*), or semi-lexical (*go*, *in*, *front*), but also clearly open-class items (e.g. *roll*, *swim*, *wriggle*).

Third, whilst lexical parameterization proposals generally attempt to reduce variation to the presence or absence (or strength or weakness) of a single feature on a given category, the LPH views variation in argument structure as dependent on the interaction of sets of semantic features on predicates and arguments. On this account, grammaticality depends on the many possible interactions of such features.

2.2.2.2 Formalizing grammatically relevant lexical semantics

Locating the source of diversity in path predication in LIs rather than in language-particular grammars raises many other theoretical issues. Perhaps the most important of these is that whilst formalization in terms of a parameter requires a statement (or set of statements) at the whole-language level, recasting the problem in terms of LIs necessitates a formal theory of how grammatically relevant semantic information is stored in the lexicon, and how such information is combined as LIs merge to form phrases and sentences. It is not clear *a priori* whether syntactic structure is a sufficient means to build up the compositional semantics of interacting LIs, or whether an independent level of semantic structure must be posited. For example, consider the following sentences, with the MANNER OF MOTION verbs *dart* and *fidget*.

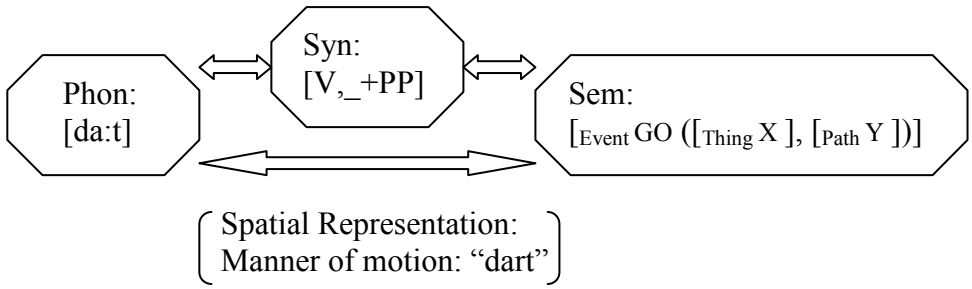
(2.19) The magpie darted {into / out of / away from / *near / *beside / *within} the nest.

(2.20) The magpie fidgeted {*into / *out of / *away from / near / beside / within} the nest.

All lexicalist accounts would agree that any difference in argument structure lies with the lexical entries of the verbs and prepositions themselves. Part of knowing the meaning of *dart* is knowing that it selects an obligatory PATH complement, whilst part of knowing the meaning of *fidget* is knowing that it cannot take a PATH complement. Similarly, knowledge of the prepositions involved is knowledge of whether they can be used in the building of a phrase with a PATH interpretation. This lexicalist assumption is independent of competing theories of the nature of LIs and how they enter into combination.

A more detailed discussion of lexical formalism will be left until Chapter 10; however, two approaches merit introductory discussion as examples of how Talmy's lexicalization patterns might be formalized under the LPH. One highly influential formal approach has been that of 'conceptual semantics', a well-articulated representational system developed over many years by Jackendoff (e.g. 1983, 1990, 1997, 2002). In this system, the lexical entry of a verb like *dart* is not one slot in a unified mental dictionary, but a series of links between independent mental modules, with their own particular combinatorial principles: phonology, syntax, and semantics in the language faculty proper, with MANNER information in a non-linguistic module of spatial representation (Jackendoff, 1990: 88). As such, an LI is not so much a single entity as a relation between mental representations. A simplified entry for the verb *dart* would be something like the following.

(2.21)



Phonological, syntactic, and semantic structures are built in parallel: whether a given sentence is well-formed depends not only on the internal combinatorial principles of each module, but on the correspondence between module outputs. PATH is here treated as a semantic element, not directly visible to the syntactic module, but part of semantic structure. Syntactic and semantic representations corresponding to example (2.19) are given below.

(2.22) a. [IP [DP The magpie] [VP [V darted] [PP [P into] [DP the nest]]]]

b. [Event GO ([Thing MAGPIE], [Path TO ([Place IN ([Thing NEST])])])]

Each interpretable syntactic constituent of a sentence maps into a conceptual constituent, although the reverse is not true, as some conceptual constituents may be contained within LIs, such as the conflation of TO and IN in the LI *into*. The conceptual structure in (2.22b) contains the elements EVENT, THING, PATH and PLACE, which are examples of what Jackendoff terms 'ontological categories'; they are basic concepts that support complex thought. The conceptual structure above also contains 'conceptual functions'. The event-function GO combines a THING and a PATH to form an EVENT. The path-function TO combines a PLACE and a THING to form a PATH. Thus in conceptual semantics, the various differences in the predication of PATH

within a single language and across languages are stated in terms of the semantic structures associated with lexical items.

Drawing on the work of Jackendoff (1983, 1990), Emonds (1991; 2000) adopts an alternative approach, arguing that there is no need to build a separate combinatorial system out of elements such as MOTION, PATH, LOCATION, etc. Rather than postulate two structurally similar combinatorial systems ('X-bar syntax' and 'X-bar semantics'), a more economical approach would be the incorporation of grammatically relevant semantic elements into syntax, which is necessary in any case. The first step in this process is to recognize that despite various influential attempts to dispense with part or all of Chomsky's (1965) 'classical' syntactic subcategorization (Grimshaw, 1979; Bresnan, 1982; Pinker, 1989), broad generalizations of syntactic selection remain pervasive and convincing. Syntactic subcategorization holds across metaphorical uses, phrasal verbs and idioms in ways which elude a unified semantic account. For example, *have* invariably selects a single DP argument and *put* invariably selects DP^PP, as can be seen in the following selection of possible and impossible idiomatic expressions.

(2.23) a. *have* {a cold, friends, a look, a heart of gold, fun, a go, pity, backbone, class, sense, the jitters, one's way, what it takes, (half) a mind to, the nerve to, etc.}

b. *put* {someone / something} {to the test, on trial, in jeopardy, on hold, at risk, off ('irritate', or 'delay'), through ('connect'), on record, out of one's mind, etc.}

(2.24) a. *have* *{someone / something} *{to the test, on trial, in jeopardy, on hold, at risk, off ('irritate', or 'delay'), through ('connect'), on record, out of one's mind, etc.}

b. *put* *{a cold, friends, a look, a heart of gold, fun, a go, pity, backbone, class, sense, the jitters, one's way, what it takes, (half) a mind to, the nerve to, etc.}

(adapted from Emonds, 2000: 40-41)

Although Jackendoff (1990) specifically attempts to make subcategorization frames redundant by elaborating conceptual semantic structures to the extent that they account for all argument selection, he admits that syntactic subcategorization is indispensable in some cases, such as idiosyncratic PP selection, 'obligatory adjuncts', and concealed questions (Jackendoff, 1990: 255-257).

Emonds' (2000) second step in providing a unified account of argument selection is to redress an important problem inherent in classical subcategorization. To return to the example of the darting magpie in (2.19), it would be inadequate to characterize the verb *dart* as simply selecting a PP complement. As shown in the example, the verb specifically requires a directional PP complement. By incorporating into subcategorization frames grammatically relevant semantic features (such as MOTION, MANNER, PATH, PLACE), stating such complement restrictions is straightforward. In such a system, a simplified lexical entry for *dart* would be something like the following, where the plus sign + precedes argument specifications, angled brackets indicate order-free notation, and the complement head is understood to project a phrase in syntax (see Emonds, 2000: Ch.s 2, 3 and 8, for further commentary on aspects of this formalism).

(2.25) *dart*, V [MOTION, MANNER], +<P [PATH]>

In this case, the verb *dart* specifies that PATH must be lexicalized in its complement. In Chomsky's (1965: 93) original terminology, the verb specifies PATH as a 'contextual feature'. However, verbs may also carry elements such as PATH as 'inherent features'. For example, a verb such as *enter* is inherently directional, and selects a DP complement.

(2.26) *enter*, V [MOTION, PATH], +<D>

(2.27) a. The fox entered the henhouse.

b. The fox entered {*in / *into / *(to the) inside of} the henhouse.[14]

Using Emonds' (1991, 2000) elaboration of Chomsky's subcategorization theory, the types of lexicalization patterns discussed by Talmy (1985, 1991, 2000b), both within and across languages, may be formalized without necessarily resorting to additional combinatorial semantic mechanisms. This is the approach I adopt in this thesis, though the transparency of the formalism allows for easy translation into other frameworks.[15]

Whether one opts for a more semantic or a more syntactic approach to lexical semantic representation and argument selection, the LPH places a greater burden on the language-acquiring child: there is more to learn than a single input-triggered parameter setting. However, from a more positive perspective, children must learn the

[14] This subcategorization of DP is strictly observed in all but metaphorical cases, where the motion is not physical e.g. *enter into an agreement*, *enter data into a computer*. For some reason, abstract *enter* (obligatorily) selects *into* PP; I have no account for this, but note that the complement restriction is just as robust in the abstract case.

[15] Further justification of a syntactic approach to semantic feature combination is given in Section 10.2.

LIs in their language in any case, so S-framed and V-framed lexicalization patterns could be piggy-backed onto this same process of lexical acquisition. Nonetheless, the LPH raises its own set of questions in the domain of acquisition, as we shall see below.

2.2.3 Acquisition as lexical fine-tuning

Acquisitional findings in respect of the main relational categories, namely verbs and adpositions, have until now proved inconclusive in selecting between competing theories of representation. The acquisition of verbs has been studied intensively in certain regards, such as alternations in argument structure (e.g. Pinker, 1989; Gropen, Pinker, Hollander, Goldberg and Wilson, 1989; Gropen, Pinker, Hollander and Goldberg, 1991), but debate continues as to whether argument-structure semantics is best represented semantically or syntactically, and whether it is best understood as projected from lexical entries (Grimshaw, 1990; Levin and Rappaport Hovav, 1995, Emonds, 2000, Jackendoff, 2002), or whether verbs are inserted into syntactic structures with their own inherent meanings (Fillmore and Kay, 1993; Goldberg, 1995, Borer, 2004). However, in support of the LPH, certain findings do provide evidence that lexical semantic features are utilized by children in the acquisition of precise verb meanings and argument selection. The general conclusions of this line of research are that (i) decompositional semantic features are psychologically real; (ii) certain semantic features appear to play a role in syntax from the earliest stages of production; (iii) children use semantic features to determine argument structure in exactly the same way as adults; and (iv) errors in argument structure derive from two sources: the overapplication of rules of alternation, and more importantly for this study, incorrect or inexact lexical representations of predicates. The first three conclusions have been reached through a variety of studies, but all can be said to follow from the

experiments of Gropen, Pinker, Hollander and Goldberg (1991) on the acquisition of locative verbs, which is described in the following subsection. There follows an overview of the evidence for the sources of errors in argument structure.

2.2.3.1 Acquisition of the lexical semantics of locative verbs

Gropen et al. (1991) is a pivotal study of the role of lexical semantics in syntactic argument structure, and it is worth examining their methodology and findings in some detail. Their hypothesis was that causative motion verbs with a MANNER component select a FIGURE as the direct object (*He rolled the ball into the hole* / **He rolled the hole with the ball*), CHANGE-OF-STATE verbs select a GROUND as the direct object (*He covered his head with the hat* / **He covered his hat onto his head*), and verbs with both components allow alternating argument structure (*He smeared paint onto the canvas* / *He smeared the canvas with paint*). Nonce verbs were taught to children with rich environmental context, through the use of experimental props, and in the absence of syntactic context, through the introduction of the new word in the gerund (e.g. 'Look! This is *pilking*.'). In the first experiment, two novel verbs were taught to three groups of children (16 aged 3;4 to 4;5; 16 aged 4;7 to 5;11; and 16 aged 6;5 to 8;6) and an adult control group. Pennies or marbles were made to move in a hopping manner to a cloth, which did not move when they landed (the MANNER condition), or they were moved with no particular manner to the cloth, which then sagged (the CHANGE condition). Test subjects were asked a a FIGURE-bias question, such as 'Can you tell me what I'm doing with the *pennies*?', and a GROUND-bias question, such as 'Can you tell me what I'm doing with the *cloth*?'. The discourse context of the former makes the choice of a FIGURE as direct object more 'natural', and the same is true, *mutatis mutandis*, for the GROUND question. The expected argument structure for the

first condition was 'You're *pilking* the pennies onto the cloth' (FIGURE as direct object), and the expected argument for the second condition was 'You're *pilking* the cloth with the pennies' (GROUND as the direct object).

In accordance with theoretical predictions, test subjects in all age groups more frequently mapped the FIGURE onto the direct object when using the MANNER verb than when using the CHANGE verb, and more frequently mapped the GROUND onto the direct object when using the CHANGE verb than when using the MANNER verb. However, despite the desired statistical significance, the results were not uncomplicated. Although predictions were borne out in a contrastive analysis of the two verbs, FIGURE-objects were chosen predominately for *both* manner and endstate verbs. In MANNER verb responses, FIGURE-objects were preferred across both question types (mean 97% for FIGURE-bias question and FIGURE-object; mean 78% for GROUND–bias question and FIGURE-object). In CHANGE verb responses, GROUND-objects were preferred only in responses to GROUND–bias questions (mean 52% GROUND-objects; mean 47% FIGURE-objects), whilst FIGURE-objects were preferred in responses to FIGURE questions (mean 81% FIGURE-objects; mean 17% GROUND-objects), so that the overall preference across question types was for FIGURE-objects (mean 66% FIGURE-objects; mean 32% GROUND-objects).

This first set of results was almost certainly skewed due to a methodological flaw. Apparently, 'the experimenter often had to nudge the packet into the unsupported material in order to initiate the sagging' (Gropen et al, 1991: 171), making the MANNER interpretation over-salient, when a neutral context was required. Subjects may have interpreted the verb not as a pure CHANGE verb but as an alternator with a similar representation to *stuff*, which would account for the high number of FIGURE-object responses in the CHANGE condition. In a second experiment, designed

to eliminate this flaw, the same teaching procedure was used with the same number and range of test subjects, but with a much clearer CHANGE condition. A sponge or a cotton-ball was moved in a zig-zag path to a square cloth which did not change state (the MANNER condition), or alternatively it was moved directly to the cloth causing a change in colour, as either baking soda or lemon juice on the sponge came into contact with cabbage juice on the cloth (the CHANGE condition). The results not only replicated the findings of Experiment 1 as regards the relative preference for figure-objects with the manner verb and ground-objects with the endstate verb, but this time the preference for ground-objects when using the endstate verb was evident across both figure and ground question types, and across all age groups. In this condition, GROUND-objects were preferred not only in responses to GROUND questions (mean 94% GROUND-objects; mean 5% FIGURE-objects), but also in responses to FIGURE questions (mean 88% GROUND-objects; mean 11% FIGURE-objects), so that the overall preference this time was for GROUND-objects (mean 91% GROUND-objects; mean 8% FIGURE-objects). These results indicate that when a change of state is salient enough, the GROUND rather than the FIGURE will surface as the direct object, and they suggest that both forms of mapping are equally canonical. Thus neither of the following examples is a derived structure.

(2.28) The magician put the hat over the rabbit.

(FIGURE as canonical direct object)

(2.29) The magician covered the rabbit with the hat.

(GROUND as canonical direct object)

These linking regularities appear to exist from the earliest stages of production. Indeed, in a modified replication of the above experiment with younger test subjects, Stringer (2000) found that even the youngest participant, aged 2;10, had completely adult-like argument structure both in the MANNER condition (FIGURE as direct object, GROUND as indirect object) and in the CHANGE condition (GROUND as direct object, FIGURE in an adjunct PP), in all her responses irrespective of question bias. These results strongly support the claims that sub-lexical semantic features have psychological reality, that they play a role in syntax, and that there is continuity between child and adult grammar in this respect.

2.2.3.2 Errors in the acquisition of argument structure

If young children already understand the semantics-to syntax mapping involved in the alternations such as the locative, it can be assumed that errors in argument structure do not come from imperfect knowledge of linking regularities. Such errors may generally be put down to two factors: the overapplication of 'broad-range' rules of alternation, and the incorrect or inexact lexical representations of predicates (Pinker, 1989: Ch. 7). The first source of errors can be seen in the following examples of overgeneralization in *adult* speech.

(2.30) 'He squeezed them [fish fillets] with lemon juice.' (locative)

(2.31) 'I explained him the problem.' (dative)

(2.32) '…the Parti Quebecois began to deteriorate the health care system.' (causative)

(Pinker, 1989: 154-160)

Certain child speech errors are arguably derived in the same way, as one-off innovations that are rejected when the speaker is asked to consider them. This hypothesis may seem counter-intuitive, until one realizes how rare alternation overgeneralizations really are in child speech, and how sensitive children can be in respect of their own errors. For example, although almost all English-acquiring children make errors with the dative alternation, and although the many examples collected by researchers demonstrate that the errors are far from random, when Gropen, Hollander and Pinker analyzed a corpus of 86,332 child utterances with double-object datives, it furnished them with only 22 illustrative examples of overgeneralized forms, an error rate of 0.0002% (Pinker, 1989: 21-22; 319).

That children may recognize the ungrammatical status of overgeneralized alternations can be seen in two intriguing sets of data that bear on the causative alternation. Typical examples of such overgeneralizations attested in child speech include the following.

(2.33) a. 'Go me to the bathroom before you go to bed.' (= take) Christy: 3;10

b. 'Eva won't stay things where I want them to be.' (= keep) Christy: 4;5

c. 'Be a hand up your nose.' (= put) Christy: 5;0

(Bowerman, 1982)

Hochberg (1986) conducted a grammaticality judgement experiment with children in the same age range as Christy (above), in which two puppets talked, and children had to award gold stars to the one who spoke 'better'. When one used an ungrammatical lexical causative such as *come*, *fall*, *stay*, *be* or *go* and the other used the correct form

with *bring*, *drop*, *keep*, *put* or *take*, the appropriate form was chosen 78% of the time by 3 year-olds, and 92% of the time by 4 year-olds. In the case of the causative, many overgeneralized forms appear to be rejected by the child on acquisition of the corresponding causative verb. Evidence for this is found in further examples from the speech of Christy aged 3 to 6, in which she demonstrates metalinguistic knowledge of the causative by correcting errors in her own speech and in the speech of others.

(2.34) a. 'And go…put it like that.' [telling her mother to turn the tops of her socks over in a certain way] Christy: 3;8

b. 'I'm not going to pick up the Cheerios that I fall…that I drop on the floor.' Christy: 5;4

c. Eva (younger sister): 'Will you learn me how to read that book?' Cristy (making fun): '*Learn* you? What does she mean, *learn* you?' Christy: 6;3

(adapted from Bowerman, 1982)

Whilst adult alternation errors tend to be with argument mapping (e.g. 2.30-32), rather than alternate verb stems (2.33), both sets of errors seem to be subject to self-correction in this way. However, not all alternation errors can be explained in this fashion, even with the types of examples just cited. Although it is generally accepted that the vast majority of children's utterances with causatives, datives and locatives are adult-like at all stages, and that children generally recognize overgeneralized forms at all stages, there is evidence of crucial differences in adult and child LIs at certain periods of development, which contradict the general pattern. It appears that,

in certain cases, child LIs may continue for certain periods in the developing lexicon as over-specified or under-specified: that is, they may contain additional semantic features absent in the adult LI, or be missing features which characterize the adult LI. In both cases, by hypothesis, these non-adult lexical representations will systematically project non-adult syntactic structures.

As an example of the former, Bowerman (1982) reports that in the case of Christy, after initial adult-like usage of the intransitives *come* and *stay* and the transitives *bring*, *keep* and *leave*, there was a particular stage in which two things happened simultaneously: *come* and *stay* were overgeneralized to causative contexts, whilst *bring*, *keep* and *leave* disappeared from the production data. This appears to indicate incorrect lexical representations rather than on-the-spot innovations, with *come* and *stay* having an optional CAUSE feature (or an equivalent in semantic substructure). In another example from the same source, Bowerman shows that overextension of argument structure is possible even in comprehension, as following exchange shows.

(2.35) Mother: 'Simon says, touch your toes.' Christy: 'To what?'
(interprets toes as FIGURE, is now looking for GROUND.
A moment later:) Mother: Simon says, touch your knees.'
Christy: 'To what?' Christy, 4;3

It is highly unlikely that this could be a temporary innovation of the type that adults make, as adult innovations are inevitably mistakes of production. For example, if one adapts Pinker's (1989: 157) attested example given in (2.30) above, one can imagine a TV chef advising his viewers, 'Now all you have to do is squeeze the fish with some

lovely, fresh lemon juice.' However, it is hard to imagine the viewers all picking up their fillets and squeezing them rather than the lemons.

As an example of underspecification, children often make errors with spatial adpositions, using several common prepositions as general markers of location rather than as specifying particular geometric relationships. For example, the prepositions *on* and *under* are often used as synonyms of adult *in*, and *under* is sometimes found as a synonym of *on* (Clark, 1973). I noted both in the speech of my daughter, e.g.

(2.36) a. 'Go on the car?' (IN → *on*) Tamsin: 1;10

b. ['Where's the sweetie?'] 'Under the table.' (ON → *under*) Tamsin: 2;1

Following Emonds' (2000) feature hierarchy wherein prepositions marked as either directional [PATH], or locational [PLACE] are all subsumed in a general class of spatial prepositions [LOC], it is possible that such uses are due not to overgeneralization from a 'core meaning', but rather to feature under-specification, all being initially represented by the child as [LOC]. Other evidence of underspecification in adpositions comes from selectional constraints. It takes children a while to understand that verbs can be very picky about their prepositional complements. Child subcategorization frames can be less specific, leading to the following types of errors.

(2.37) a. 'They went to stay at the puppy.'

b. 'He's pointing his finger to it.'

c. 'He took me at the circus.'

(Menyuk, 1969)

Thus underspecification may be seen as a characteristic not only of the inherent features of LIs, but also of their contextual features.

2.2.3.3 Predictions for a lexicalist account of PATH predication

Bearing in mind the various incarnations of lexicalist theory and the developmental phenomena that come within their scope, let us now consider the kinds of evidence that would constitute support for the Lexicalist Path Hypothesis over the Path Parameter Hypothesis, in anticipation of the empirical investigation into PATH predication in English, French and Japanese. Firstly, the five predictions of the PPH (see Section 2.1.3.4) hold in reverse. The LPH is more likely (i) if both types of PATH predication exist *in a single language* in such a way that the language cannot be characterized as S-framed or V-framed; (ii) if *all three languages* admit such internal variation (to any degree); (iii) if PATH verb syntax is not homogenous, but varies from predicate to predicate; (iv) if acquisition proceeds verb by verb, or adposition by adposition, rather than by a language-wide triggering mechanism; and (v) if syntactic possibilities in predication do not vary by language type, such that there is a common syntax in all three languages.

Secondly, if a grammatically relevant semantic subsystem is a determining factor in path predication, we expect to find one of two scenarios: either consistent, early-acquired, adult-like lexical representations (with the possibility of one-off innovations due to over-application of broad-range rules), or occasional but systematic evidence of overspecification or underspecification of LIs, resulting in non-adult like inherent semantics and contextual syntax. This should hold in all three languages under investigation.

It is here where lexical semantic theory meets crosslinguistic evidence that we enter our final area of preliminary discussion. A considerable amount of previous crosslinguistic research has been conducted on the basis that analysis is possible by means of comparing different combinations of words and morphemes, using either literal translations of the original lexical items, or glosses indicating their grammatical import, and often a combination of the two. In one sense, this has to be an integral part of crosslinguistic study. However, syntactic analysis on the basis of literal translation at the lexical level is problematic when the syntax under investigation is in any sense lexically determined. If, for example, a preposition P^1 in language L^1 has a corresponding preposition P^2 in another language L^2, one might be tempted to apply the following reasoning: if P^1 shows up in a particular syntactic environment whilst P^2 does not, then the syntax of L^1 and L^2 differ in some language-particular way. However, a closer inspection of P^1 and P^2 may well reveal that they do not exactly correspond: moreover, a particular difference in lexical specification may be the very reason for the crosslinguistic variation under investigation. Assumptions of 'lexical equivalence' have led to some confusion in the debate over S-framed and V-framed syntax. It is therefore important to consider the extent to which literal translation is possible, with specific reference to verbs and adpositions in motion events.

Chapter 3

The lexical comparison conundrum

One problem that perennially dogs comparative linguistics is the inexactitude of lexical translation. It is rare indeed to find exactly equivalent items in the open-class lexicon, and elements of the closed-class lexicon appear to have both unique syntactic behaviour within a single language, and no doppelgangers in other languages (Emonds, 1985: 165-170, 2000: 115). This is the case both in terms of the formal syntactic properties associated with lexical items and in terms of the contours of the concepts they represent. As there are no exact lexical equivalents of the English preposition *up* in either French or Japanese, it is impossible to run a crosslinguistic experiment focused on the acquisition of equivalents of this morpheme. This is true, to a greater or lesser extent, of most of the adpositions and many of the verbs under investigation. Thus one cannot run one experiment in three different languages holding all variables constant other than a given lexical item (presumed to correspond in the three languages); rather, one must run three different experiments set up in such a way as to make crosslinguistic comparison possible. In this investigation of English, French and Japanese, the object of study is not a universal lexicon with three sets of translations, but three lexicons. This necessitates the hypothesis of a descriptive metalanguage in terms of shared, syntactically-relevant concepts. Yet no linguistic transcription may be purely descriptive: every description carries theoretical assumptions. As such, before describing the acquisition questions arising from crosslinguistic variation, some preliminary observations are in order regarding glosses, translations, and terms of analysis. Firstly, the paradoxical nature of glosses must be

made clear: while indispensable for crosslinguistic analysis, they can be quite misleading, especially for the closed-class lexicon, and should always be understood as rough approximations to the fine detail of lexical semantics. Secondly, this caveat is extended beyond glosses in the form of a general principle of 'lexical relativity', which is then discussed with reference to two other means of comparison used in the S-framed / V-framed debate: 'literal translation' and the generation of nonce forms for experimentation. Finally, in order to establish a degree of clarity for the subsequent empirical investigation, I introduce my adopted basic terminology of syntactic categories and semantic features.

3.1 The gloss trap

Detailed crosslinguistic analysis unarguably benefits from (and often depends upon) morpheme-by-morpheme glosses in addition to translations at the sentence-level. However, whilst the shift in translation from sentence to morpheme-level always provides a closer view of the syntactic workings of a sentence, it gives no indication of semantic differences at the lexical level, many of which play a role in determining the syntax, and all of which contribute to the compositional meaning of the sentence. This point may be illustrated with a brief look at some contrasts between two adpositions, French *à* and Japanese *ni*, and their common English glosses.

The French preposition *à* as found in motion events is usually glossed as either 'at' or 'to', depending on whether the interpretation is locational or directional, as shown below:

(3.1) Gilda était à la gare. PLACE

Gilda was at the station

'Gilda was at the station.'

(3.2) Gilda est allé à la gare. PATH

Gilda AUX gone to the station

'Gilda went to the station.'

However, whilst glossing *à* as 'at' or 'to' in such a context may be appropriate for a particular level of analysis, it would be inaccurate to assume that it is equivalent to either English preposition. Such assumptions may lead to the following type of misanalysis.

The wrong rationale:

Step 1: In English, one can say:

(3.3) Gilda waded to the sandbank.

Step 2: In French one cannot say:

(3.4) *Gilda a pataugé au banc de sable.

Gilda AUX waded to-the bank of sand

'Gilda waded to the sandbank.'

Step 3: In French one must express this with a PATH verb:

(3.5) Gilda est allé au banc de sable en pataugeant
Gilda AUX went to the bank of sand by wading
'Gilda waded to the sandbank.'

Step 4: Therefore French and English syntax differ in this respect.

The reason this analysis falters is the gloss in Step 2, which holds *à* and *to* as 'equivalent' (i.e. having the same lexical properties and syntactic effects). Whilst English *at* is strictly and inherently locational,[1] and English *to* is strictly and inherently directional, French *à* is a more general spatial preposition which is locational by default, and directional only in the appropriate syntactic environment, i.e. when it is the complement of a directional verb. French *patauger* 'wade' is not such a verb.[2] If the example in Step 2 contained a *bona fide* directional preposition such as *vers* 'towards', the 'English' pattern would be perfectly possible:

(3.6) Gilda a pataugé vers le banc de sable.
Gilda AUX waded towards the bank of sand
'Gilda waded towards the sandbank.'

[1] Other than in the 'conative' and 'directive force' senses, e.g. *He cut at the rope*; *They ran at the enemy*. Note the impossibility of a simple directional sense in e.g. **She walked at her friend*; **We drove at our destination*.
[2] Indeed, *patauger* also fails to map exactly onto the meaning of its English 'equivalent', *wade*. While an appropriate translation in examples such as (3.5), in its intransitive use *patauger* may have a playful, non-directional sense, more aptly translated by 'splash about'.

From this perspective, the differences between French and English in the above examples appear to be lexically determined, not syntactically determined.

Similar argumentation holds for glosses of Japanese *ni*, which is likewise ambiguous between locational and directional interpretations:

(3.7) Hiro wa gakko ni imashita. PLACE
Hiro TOP school at was
'Hiro was at school.'

(3.8) Hiro wa gakko ni itta. PATH
Hiro TOP school to went
'Hiro went to school.'

English glosses of *ni* exhibit even more variation than French *à*, due to a relatively impoverished inventory of directional adpositions in Japanese.[3] Both French *à* and Japanese *ni* indicate location conceptualized as a 0-dimensional point in space, or arrival at that point. However, if a French speaker conceptualizes the GROUND not as a point but as a 3-D interior space, or as a 2-D surface, the prepositions *dans* 'in' and *sur* 'on' are respectively more appropriate.

(3.9) Gilda était {dans la mer / sur le toit}. PLACE
Gilda was {in the sea / on the roof}
'Gilda was {in the sea / on the roof}.'

[3] This does not entail an impoverished means of expressing motion events: Japanese has many motion verbs, and can further specify geometric information by combining postpositions with a rich system of 'locative nouns', as discussed below, and in Chapters 4, 5 and 6.

(3.10) Gilda {a sauté dans la mer / a grimpé sur le toit}. PATH

Gilda {AUX jumped in(to) the sea / AUX climbed on(to) the roof}

'Gilda {jumped into the sea / climbed onto the roof}.'

Japanese *ni* serves as an all-purpose locative postposition in such cases, as shown below.

(3.11) Hiro wa {umi ni / yane ni} imashita. PLACE

Hiro TOP {sea in / roof on} was

'Hiro was {in the room / on the roof}.

(3.12) Hiro wa {umi ni jampu shita / yane ni nobotta}. PATH

Hiro TOP {sea in(to) jump did / roof on(to) climbed}

'Hiro {jumped into the sea / climbed onto the roof}.'

The assumption that the multiple glosses of *ni* have a theoretical status could lead not only to the PATH / PLACE confusion we saw above with French *à*, but also to further misanalysis if geometric properties are taken into account, as follows:

The wrong rationale:

Step 1: In English, one can say:

(3.13) Mika danced into the room.

Step 2: In Japanese one cannot say:

(3.14) *Mika wa heya ni odotta.
Mika-TOP room in(to) danced
'Mika danced into the room.'

Step 3: In Japanese one must express this with a PATH verb:

(3.15) Mika wa heya ni odotte haitta.
Mika-TOP room into dancing entered
'Mika danced into the room.'

Step 4: Therefore Japanese and English syntax differ in this respect.

Again, the reason this analysis falters is the gloss in Step 2, which holds *ni* and *into* as equivalent. In parallel to the French examples above, *ni* is unlike English *into* in that it is not inherently directional. The directional reading is only possible when *ni* is the complement of a directional verb. Japanese *odoru* 'dance' is not such a verb. Moreover, as shown above, whilst sometimes found in the same surface environment, Japanese *ni* is unlike English *in* and French *dans* in that it has no geometric specifications in any case (thus French *sauter dans* –'jump in' is not equivalent to Japanese *ni jampu suru* –'LOCATIVE jump-do'). Again, the differences prove to be due to lexical aspects of the P.

The importance of the gloss trap cannot be overstressed, as it is responsible for much confusion in the comparative literature on S- and V-framed languages. It can be

viewed as part of a wider problem in comparative linguistic studies, as some notion of 'lexical equivalence' almost invariably lays the groundwork for analysis, even where glosses are not given. In the following section, it is argued that in contrast to universal principles of syntax and phonology, lexical semantic representations are relative to language-particular lexicons, rendering morpheme and lexeme translation possible only in terms of degrees of approximation. Two particular examples from the literature on Talmy's typology are then subjected to discussion, revealing inherent problems in the accepted idea of lexical equivalence as a basis for comparison.

3.2 Lexical relativity

Word-for-word or morpheme-for morpheme translations are seldom exact in their reflection of the properties of the original expression, for several reasons. Firstly, a lexical item is defined partly in relation to other lexical items in the same language. This point was made eloquently and influentially by Saussure (1983 [1916]: 112-120), who argued that the 'sense' of a word can be thought of as a linguistic 'value'. Just as the value of a coin can be determined by its relation to something *dissimilar* that can be exchanged for the coin (e.g. bread), and by its relation to something *similar* that can be compared with it (e.g. other coins in the same currency, or a coin in a different currency), a word can be substituted for something dissimilar (i.e. an idea) and can be compared with something similar (i.e. other words). To follow through with this metaphor, the semantic value of a word is determined not only by its relationship with an associated concept, but by its relationship to other words in the same linguistic system. Saussure illustrates this point with several well-known examples. The French word *mouton* corresponds both to English *sheep* and *mutton*, i.e. it refers both to the animal and the meat. In this comparative light, the scope of the meaning of English

sheep can be seen to be partly determined by the existence of the term *mutton* (ibid. 114). Another illustration of relative semantic value is the differences between 'synonyms' in a single language: French verbs such as *redouter* 'to dread', *craindre* 'to fear', and *avoir peur* 'to be afraid' have particular meaning only in contrast with other members of the set; if one of these lexical items did not exist, its nuances would be shared out among the other members (ibid.114). Saussure argued that this is also true in respect of closed-class morphology. In Sanskrit, the equivalents of the French *mes yeux*, *mes oreilles*, *mes bras*, *mes jambes* ('my eyes, my ears, my arms, my legs') are not plural, but dual. Thus the semantic value of the French plural morpheme does not correspond exactly to that of the Sanskrit plural: the meaning of the latter is determined relative to the existence of the dual.

Saussure describes this fundamental characteristic of the lexicon in negative terms: words are defined through their differences with one another, in contrast with one another. '*In the language itself, there are only differences*…although in general a difference presupposes positive terms between which the difference holds, in a language there are only differences, *and no positive terms* (ibid. 118, italics in the original)'. Only when the semantic and phonological values are arbitrarily linked does the 'sign' as a whole take on a positive aspect (ibid. 118-9). However, as Bloom (2000: 73) notes, opposition in and of itself is insufficient to charcterize lexical meaning. Whilst words in a given relational set may be characterized with reference to one another, the opposition between, say, *enter* and *aardvark* does not contribute to our understanding of the meaning or syntactic behaviour of either item. Moreover, if the contrasts in question are all between closely related items, we need to be able to say how the items are related as well as what distinguishes them, and it is unclear how such groupings could be made without reference to positive aspects of meaning.

A second reason that literal lexical translation is often inexact is apparent on consideration of lexical items in positive terms, with regard to their conceptual content. This can be thought of in terms of three kinds of conceptual variation: firstly, those inherent conceptual elements that play no role in syntax; secondly, those inherent semantic elements that have syntactic effects; and thirdly, those contextual semantic elements that predicates require in their arguments. The first type will not be subjected to much discussion here: suffice to say that this is a typical rather than exceptional characteristic of open-class lexicons.[4]

With regard to syntactically relevant inherent features, I assume the following: if lexical items X and Y are corresponding elements in two different languages, but if X has one additional feature, or one feature less, then X and Y must be 'non-equivalent' in some sense. If such a feature is obligatory in the representation of X, but optional in the representation of Y, then again, X and Y must be 'non-equivalent' in some sense. Sublexical features such as PATH and PLACE are such distinguishing features on spatial adpositions, either present or absent, obligatory or optional. As seen in the preceding section, they interact with syntax, making it difficult to assume that French *à* is an equivalent lexical entry to either *at* or *to* in English. Similarly, the English preposition *on* involves CONTACT with a surface, something which usually applies to French *sur*,[5] but remains unspecified in Japanese PPs with the lexical item *ue* (sometimes translated 'on', but which I later argue to be a noun, closer to English

[4] Differences in denotational scope are readily seen on close examination of most pairs of corresponding open-class lexical items. For example, the English noun *sink* is used for both a kitchen sink and a bathroom sink, whereas the French *évier* is a sink typically used for washing dishes, and *lavabo* is reserved for a sink for washing hands. One cannot explain this purely in terms of Saussurean contrast, because English also has the terms *handbasin* and *washbasin*, which correspond to *lavabo*, yet they do not conflict with the term *sink*. The latter just happens to have wider denotational scope than its French counterpart. These types of examples are easily multiplied, but our concern here is with the other two types of lexical conceptual content.

[5] This is violable in French. Consider *un pont sur la riviere* – a bridge on the river – 'a bridge over the river'.

top). For example, the Japanese sentence below is always semantically ambiguous in respect of the bird's contact with the tree.

(3.16) Tori wa eda no ue de utatteiru.

bird TOP bough GEN top at sing-PROG

'A bird is singing {on / above} the bough.'

In a related discussion of crosslinguistic variation in the lexical encoding of CONTACT and CONTAINMENT, Bowerman (1996) shows that English, Finnish, Dutch and Spanish each have distinct lexicalization patterns in prepositions and cases approximately corresponding to *in* and *on*, whilst in similar events of placement and removal, Korean uses neither CONTACT nor CONTAINMENT to determine the choice of predicate, but a different semantic distinction: TIGHTNESS-OF-FIT. Whilst in English one can put a jigsaw *on* a table and a top *on* a pen, in Korean one must use the verb *nehta* ('to fit loosely') for the former and *kkita* ('to fit tightly') for the latter. Similarly, whilst in English one can put a pen *into* a case and a piece *into* a jigsaw, in Korean one must use *nehta* for the former and *kkita* for the latter.

Aside from elements such as PATH, PLACE, CONTACT, and CONTAINMENT, which have been shown to have syntactic effects in several languages (Talmy, 1985; Pinker, 1989; Levin, 1993), verbs and adpositions in motion events also vary systematically in their representation of spatial geometric features, in ways which seem to make plausible their candidacy for syntactic relevancy. For example, the English verb *cross* has no one literal translation in Japanese, but may be rendered as either *wataru* or *yokogiru*. The former is used when the crossing of a principal axis is conceived of as along a PATH with its own legitimate axial flow, such as crossing a

bridge, or crossing a road using a pedestrian crossing. The latter is used when the path is seen as 'cutting across' in the absence of a legitimate cross-axial flow, for example when walking from the left side to the right side of a bridge, or when crossing the road by cutting through the traffic.

For those unfamiliar with Japanese, this may at first seem like a rather obscure distinction; however, the same spatial geometric distinction can be observed in French lexicalization patterns. Whilst the English preposition *across* has two distinct locational senses, one meaning 'on the other side of' (e.g. *Sally is standing across the road*) and the other meaning 'in opposition to the principal axis of' (e.g. *The barrier was placed across the road*), this latter sense has its own lexicalization in French, in the form of *en travers*. Thus the PP in the following examples is unambiguous: it only means that the tree was blocking the road, or that the car was positioned sideways across the lanes, not that the tree or car were on the other side of the road.

(3.17) L'arbre se trouvait en travers de la rue.

the-tree REFL find-IMP P_{LOC} crosswise[6] of the road

'The tree was lying across the road.' (i.e. 'The tree was blocking the road.')

(3.18) La voiture se trouvait en travers de la rue.

the car REFL find-IMP PLOC crosswise of the road

'The car was positioned sideways in the road.'

[6] That this distinction does not appear to be observed in English renders a precise gloss of *travers* somewhat difficult. The term *across* usually indicates 'from side to side' which does not hold of the car, and the term *crosswise* often means 'from corner to corner' (e.g. *cut the fabric crosswise*). I consider *crosswise* a valid approximation to *en travers* in most cases.

This element of 'opposition to the principal axis' is extended in French to 'opposition to a two-dimensional plane', as the term *travers* is also used in cases where a 2D plane is broken by the trajectory of the FIGURE. In the examples below, (3.20) indicates that the window was broken on entry.

(3.19) Le voleur est entré par la fenêtre.
the thief AUX entered via the window
'The thief came in through the window.' (i.e. with or without breaking it)

(3.20) Le voleur est entré à travers la fenêtre.
the voleur AUX entered P_{LOC} crosswise the window
'The thief came in through the window.' (i.e. by breaking it)

In these cases, in English one would use *through* rather than *across*, and there would be no distinction in the preposition as to whether or not the trajectory and the plane are 'in conflict'. The contrasting senses of these 'axis-crossing' verbs and adpositions are illustrated diagrammatically in Figure 3.1.

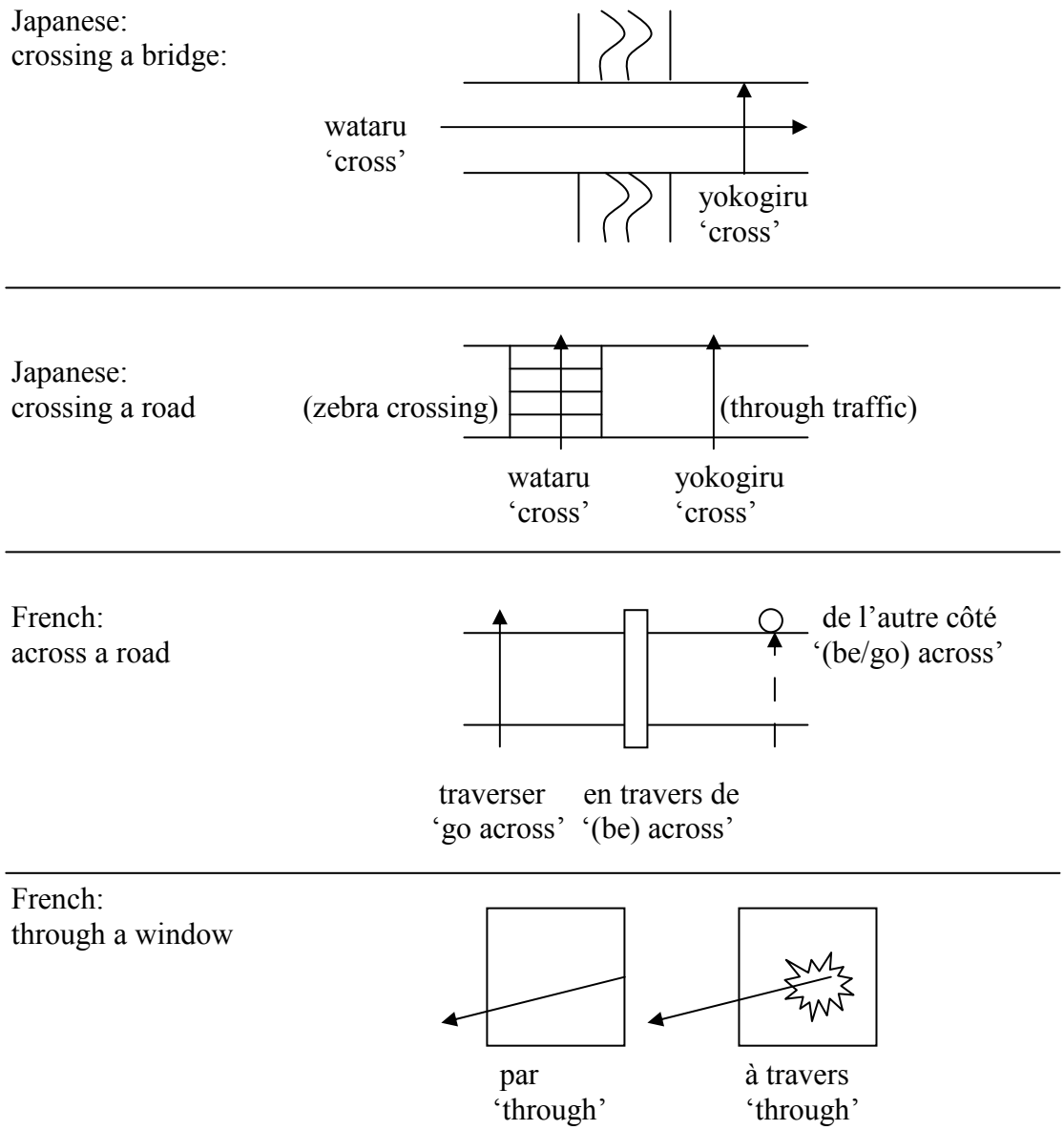


Figure 3.1. *Crossing axes in Japanese and French.*

Thus there are no universally adequate French or Japanese glosses for English *across*: the appropriate gloss depends upon the properties of the lexical items available in each language and on the context.

The third kind of sublexical variation is in the form of the selectional properties imposed by verbs and adpositions on their arguments. Literal lexical translation often does not take into account that supposedly equivalent verbs impose

different specifications on their syntactic argument structure, so that the lexical equivalent of one term in language L^1 may be a structure with two or three elements in another language L^2. This gives rise to the following three types of phenomena.

Firstly, a verb which takes a direct object in L^1 may correspond to a verb which requires a PP in L^2. English *enter* selects a direct object, whilst *put* selects a direct object plus PP. In French, however, *entrer* 'enter' selects a PP, whilst *mettre* 'put' may be used without a locative PP.

(3.21) Paul est entrée *(dans) le pré.
Paul AUX entered in the meadow
'Paul entered the meadow.'

(3.22) Thierry a mis son manteau (sur ses épaules).
Thierry AUX put his coat (on his shoulders)
'Thierry put his coat {*(on) / *(over his shoulders)}.'

Secondly, a transitive verb in L^1 may correpond to a strictly intransitive verb in L^2. Thus English *play* and French *jouer* allow objects, whilst Japanese *asobu* does not, rendering Japanese literal translation of *play* or *jouer* possible only in the intransitive case.

(3.23) a. The children played.
b. Kodomotachi wa asonda.
children TOP played

(3.24) a. The children played tennis.

b. Kodomotachi wa tenisu o shita.

children TOP tennis ACC did

Indeed, Japanese *asobu* also fails to map exactly onto the meaning of its English 'equivalent' *play* even in the intransitive use, sometimes having the sense of 'enjoy oneself' or 'have a pleasant time'. If an elderly Japanese lady kindly invites someone to her house for tea, she may say:

(3.25) Uchi ni asobi-ni-kite kudasai

house P_{LOC} play-P-come please

more literally: 'Please come and play at my house.'

intended meaning: 'It would be lovely (fun) if you could visit me sometime.'

This does not lead the visitor to expect toys and games.

Thirdly, a verb may participate in a syntactic alternation in L^1, but does not do so in L^2. Hirshbuhler (2004) notes that the English pattern of verb types in the locative alternation is not universal. The direct object of the English verb *spray* may alternate between the FIGURE and the GROUND, whilst the direct object of *pour* must be the FIGURE, and the direct object of *fill* must be the GROUND.

(3.26) a. He sprayed champagne on the winner.

b. He sprayed the winner with champagne.

(3.27) a. He poured champagne into her glass.

b. *He poured her glass with champagne.

(3.28) a. He filled her glass with champagne.

b. *He filled champagne into her glass.

However, in Japanese, Chinese and Korean, the latter type also alternates: 'fill' is something you can do to liquids as well as containers.

In the above discussion it has been illustrated how lexical items (LIs) are generally not equivalent between one language and another, and that literal translation is in many cases impossible without additional commentary. This leads to the postulation of lexical relativity as a fundamental property of human languages.

(3.29) *The Lexical Relativity Hypothesis*: When comparing lexical analogues in different languages, the meaning of any LI is relative to its ambient lexicon.

If one still wishes to proceed with comparative lexical study, there naturally arises the question of whether this endeavour is possible at all, and if so, how. The answer pursued in this thesis is that comparison is possible at the sublexical level. A lexical item may be viewed as a particular combination of (arguably universal) semantic elements, which corresponds in inexact fashion to an 'equivalent' combination in another language. If it can be shown that these sublexical features not only contribute to the precise meaning but also determine the combinatorial possibilities of the lexical item (within the constraints of Universal Grammar), then it is this sublexical level that must form the basis of comparative lexical analysis.

3.3 Garden PATHS in lexical comparison

The need to stress lexical relativity in comparative analysis rather than lexical equivalence can be illustrated with reference to two techniques that have been employed in V-framed / S-framed comparisons: literal translation of examples and the creation of nonce verbs for experimentation. First, let us examine the use of literal translation as a basis for comparison. In a review of Talmy's typology in respect of English and Spanish, Hohenstein, Naigles and Eisenberg (2004: 572) give the following two sets of examples:

(3.30) a. The children ran

b. The children ran into the room.

(3.31) a. Las niñas corrieron.

b. *Las niñas corrieron hacia adentro del cuarto.

Example (3.31.b) is an attempt to literally translate (3.30.b), for the purpose of showing that Spanish grammar does not allow directional phrases such as *into the room* to merge with manner verbs such as *run*. These examples are used to support a language-specific syntax approach: '…The issue with Spanish is that it lacks the requisite rule, so that Spanish manner verbs cannot always appear with the same directional phrases' (Hohenstein et al., 2004: 572). It is here assumed that English *into* finds its lexical equivalent in the Spanish phrase *hacia adentro de* (towards inside of). However, the assembly of this latter phrase does not take into account the lexical properties of its parts, which we shall briefly examine in turn. *Hacia* 'towards' shares

several properties with its English counterpart (it is an unbounded, transitive preposition, and can, in fact be used in 'satellite-framed syntax' e.g.

(3.32) Las niñas corrieron hacia el cuarto.
the girls ran towards the room
'The girls ran towards the room.'

Adentro 'inside', on the other hand, is an intransitive preposition (or verb particle, or satellite, depending on the analysis), which also may be used with 'satellite-framed syntax'. Thus example (3.33.a) is possible, but (3.33.b) is impossible.

(3.33) a. Las niñas corrieron adentro.
the girls ran inside
'The girls ran inside.'
b. *Las niñas corrieron adentro el cuarto
the girls ran inside the room
'The girls ran inside the room.'

Presumably, the grammatical preposition *de* is added to *adentro* to make it resemble the locative P *dentro (de)*, which is legitimately transitive, as shown below.

(3.34) Las niñas estaban dentro del cuarto.
the girls were inside of-the room
'The girls were inside the room.'

Irrespective of theoretical assumptions, it seems clear that the Spanish combination *hacia adentro de*, invented by these authors, cannot be considered a lexical equivalent of English *into*, and thus its impossibility cannot serve as the basis for the claim that Spanish grammar lacks a 'requisite rule'. The fact of the matter is that English *into* has no lexical equivalent in Spanish, a conclusion consistent with the principle of lexical relativity, which as we have seen, often renders literal translation impossible.

A second case of assumed lexical equivalence leading to problems of crosslinguistic comparison may be seen in experimental designs using nonce words. Naigles and Terrazas (1998) designed an experiment (also reported in Hohenstein et al., 2004) in which monolingual college-educated English and Spanish test subjects were shown a series of videotaped scenes of motion events with commentaries including nonce words. Test subjects were then asked to demonstrate their understanding by pointing to one of two possible scenes illustrating the new term. For the purpose of the present discussion, I wish to consider only one aspect of this experiment, namely the selectional properties of the nonce verbs. The assumption is that irrespective of the particular language, path verbs have a universal 'path-verb syntax' (Hohenstein et al., 2004: 578), in which 'the ground component surfaces as the direct object (or object of a content-poor or 'dummy' preposition)' (ibid: 571). This is in contrast to 'manner-verb syntax' (ibid: 578), in which the path is 'encoded in a content-rich preposition or satellite, and the ground component surfaces as the object of that preposition or satellite' (ibid: 571).[7] This is illustrated in the following table, showing the selectional properties of common path and manner verbs in English.

[7] Again, we see the collapsing of the terms 'satellite' and 'preposition' (cf. Section 1.2.2).

Table 3.1. *Typical argument structure of English path and manner verbs.*

Path verb complementation (V + direct object)	**Manner verb complementation (V + 'content-rich' P)**
enter (the room)	run (into the room)
leave (the theatre)	amble (out of the theatre)
cross (the street)	walk (across the street)
pass (the door)	trudge (past the door)
approach (the cave)	creep (towards the cave)
----------[8]	dive (under the waves)

This assumption of a distinction between path-verb syntax and manner-verb syntax gives rise to the postulation of identical syntactic frames for the nonce verbs in both English and Spanish, assuming that prepositions selected by path verbs in Spanish are really 'dummy' forms as suggested in the above quote. On being shown a video of a girl skipping towards a tree, the following commentaries were heard, using the invented verbs *krad* (for English test subjects) and *mecar* (for Spanish test subjects).

(3.35) Look, she's *kradding* the tree!

(3.36) Mira! Ella esta *mecando* al arbol!

look! she is *mecando* P_{LOC}-the tree

'Look! She's [nonce verb] the tree.'

Thus, the intended meaning of *krad* / *mecar* (in this particular part of the experiment) was 'move towards', and the Spanish preposition *a* was added as a likely 'dummy'

[8] Note the lexical gap: to my knowledge English has no verb meaning 'go-under' (as we shall see, neither does French, whilst Japanese has two such verbs, *moguru* meaning 'go under and stay there', and *kuguru* meaning 'go under and out the other side'.

element. Most test subjects could figure out the meaning of the new verb from hearing the utterance in the context of the video scene.

The first problem with this nonce coining is that English and Spanish already have verbs that mean 'move towards' in this context, namely *approach* (which takes a direct object) and *acercarse* (which takes a PP headed by the locative P *a*). A second complication is that the real Spanish verb differs in argument structure in that it also requires a reflexive pronoun (as does its French counterpart, *s'approcher*). In order to maintain a unified analysis of 'path-verb syntax' in English and Spanish, one would be obliged to say that in the Spanish case both the reflexive and the preposition are meaningless 'dummy' elements. Yet another serious problem for this approach is that it is difficult to maintain that locative prepositions selected by path verbs are 'content-poor' prepositions, despite apparent support from certain well-worn comparative examples. The following two sentences appear to illustrate that the French verb *entrer* 'enter' requires a 'dummy' preposition *dans* 'in' of the kind proposed by these authors.

(3.37) Jules entered the room.

(3.38) Jules est entré dans la pièce.
Jules AUX entered in the room
'Jules entered the room.'

However, there is evidence that French *dans* is never 'a content-poor or 'dummy' preposition' (Hohenstein et al., 2004: 571), because it has consistent lexical semantics in locative contexts, despite variation in verb type and in the trajectory of the FIGURE. In locative contexts, *dans* always denotes the three-dimensional interior of a GROUND.

When combined with *entrer* 'enter', the verb imposes the interpretation that the 3D internal space of the GROUND is the GOAL, or the endpoint, of the FIGURE's trajectory. However, this same PP may also be combined with a verb such as *passer*, as in the following example.

(3.39) Jules est passé dans la pièce.
Jules AUX went-via in the room
'Jules passed through the room.'

In this case, the GROUND is not the endpoint of the trajectory, as the French verb *passer* means to 'go-via' a location.[9] Nevertheless, the preposition *dans* remains invariable in its denotation of the interior of a three-dimensional space. This can here be contrasted with an alternative trajectory.

(3.40) Jules est passé sur le gravier.
Jules AUX went-via on the gravel
'Jules walked over the gravel.'

In this case, the preposition *sur* denotates a space on or above a two dimensional surface, a sense which it maintains across locative contexts. Examples such as these indicate that the concept of 'dummy preposition' should be much more restricted in scope, and call into question whether a single 'path-verb syntax' obtains whether or

[9] This example is often misunderstood by English speakers of French as a second language, who tend to assume that *passer dans* means 'pass into'. The English verb *pass*, however, provides another example of the myth of lexical equivalence. It may mean 'go-via', as in *Harry passed the shop*, but it may have a more general sense of 'move', so that *The car passed into the tunnel* just means that it entered the tunnel, not that it came out the other side.

not a PP is present, in examples such as *traverser la rue* 'cross the street' and *entrer dans le bar* 'go into the pub'.

Two observations follow from the above discussion: (i) a verb that selects a direct object differs syntactically from a verb that selects a specific type of prepositional complement; and (ii) one cannot maintain that an adposition is a dummy element if it maintains its semantics across various V^P combinations.

Table 3.2 provides a comparison of common PATH verb complementation in French and Japanese (following the English examples of Table 3.1).

Table 3.2. *Typical argument structures of path verbs in French and Japanese.*

		V + Direct Object	**V + PP**
'enter'	French		*entrer dans* DP enter in DP
	Japanese		DP *ni hairu* DP P_{LOC} enter
'leave'	French		*sortir de* DP leave of DP
	Japanese	DP *deru* DP leave	DP *kara deru* DP from leave
'cross'	French	*traverser* DP cross DP	
	Japanese	(i) DP *wataru* cross (on a transverse axial flow) (ii) DP *yokogiru* cross (against the axial flow)	
'pass'	French		*passer {par / dans, etc.}* DP go-via {via / in, etc.} DP
	Japanese	(i) DP *tooru* go-via DP (ii) DP *koeru* go-over DP	
'approach'	French		*s'approcher de* DP REFL approach of DP
	Japanese		DP *ni chikazuku* DP P_{LOC} approach
'(go) under'	French		*passer* (i) *sous* DP (ii) *en dessous de* DP (iii) *par-dessous* DP go-via (i) under DP (ii) P_{LOC} under of DP (iii) via-under DP
	Japanese	DP *kuguru* go-under (and out the other side)	DP *ni moguru* go-under (and stay there)

To summarize, whilst English *enter* requires a direct object, the French and Japanese equivalents require specific Ps and therefore differ in syntax. English *leave* also requires a direct object, whilst French *sortir* requires a grammatical P *de* 'of', and Japanese *deru* selects a lexical, locative P *kara* 'from'. 'Cross' verbs appear to have identical argument structure in their most basic form across the three languages (leaving aside variations such as *cross over* and *cross to the other side*). However, lexical non-equivalence still obtains, as the Japanese verbs are sensitive to whether or not the crossing follows an alternative axial flow, or whether it is in opposition to the transverse axial flow (as discussed above). As we have seen, English *pass* has a rather general meaning of 'move', whilst French *passer* means something like 'go-via' and may be combined with various prepositions without losing this sense. Japanese has different verbs for 'passing events' depending on whether the FIGURE goes 'by' or 'over', and they typically select direct objects. The three languages also differ in the argument structure of 'approach' verbs. English *approach* takes a direct object, French *s'approcher* is reflexive and requires a grammatical P *de* 'of', whilst Japanese *chikazuku* selects a locative P *ni*. Finally, English and French to my knowledge have no verb meaning 'go under': English uses a light verb such as *go* or a MANNER verb such as *run* plus a PP with *under*; French uses *passer* 'go-via', or a MANNER verb such as *courir* 'run' in colloquial speech, plus a PP with either *sous* 'under', *en dessous de* 'P_{LOC} underneath of', or the truly directional *par-dessous* 'via-under', whilst Japanese has two different verbs depending on whether the location is the endpoint (e.g. *he ran under the bridge* (*and stayed there*)) or a point on a trajectory (e.g. *he ran under the bridge* (*and out the other side*)). This comparison is by no means exhaustive.

Table 3.2 illustrates that even at a cursory glance, it is apparent that there is not one 'path-verb syntax' common to all path verbs across languages. Just as a preposition like English *into* does not easily find other-language equivalents in terms of its inherent semantic properties, PATH verbs such as *enter*, *pass*, *approach*, etc. do not easily find other-language equivalents in terms of their argument structure.

Clearly, glosses and other forms of literal translation can prove to be as much of a hindrance as a help if one assumes that a close lexical equivalent is reflective of the properties of the original lexical item. Glosses and literal translations are just a guide. They facilitate but cannot provide the principle basis of comparative lexical study. Moreover, where closed class items are concerned, 'closest lexical equivalents' may be eschewed altogether in favour of those distinctions of syntactic category and semantic features relevant to the particular example. Thus in this thesis, French *à* is generally glossed as P_{LOC}, indicating that it is of the category P, and that it carries the syntactically-relevant semantic feature LOCATION. Other semantic features of this item (e.g. that it forces a conceptualization of the GROUND in terms of zero dimensions, as against two-dimensional *sur* 'on' and three-dimensional *dans* 'in' will be ignored if they do not affect the syntax of the particular example. In order to maintain a degree of clarity from the outset, the following section introduces some key syntactic and semantic terminology, to be used throughout.

3.4 Terminological assumptions: Syntactic categories and computational semantic features

The syntactic categories assumed here are those that have become generally accepted in the course of the generative enterprise, as evidence and argumentation have been brought to bear on traditional categorial notions. I assume a restrictive theory of four

open-class categories: nouns (N), verbs (V), adjectives (A), and pre/post-positions (P) (e.g. Chomsky, 1981, 1995b; Emonds, 1985, 2000). In syntax proper (i.e. beyond morphology), each category X acts as the head of a phrasal unit XP subsuming any modifiers or complements of the head. Recent debate on 'bare phrase structure' notwithstanding (Speas, 1990; Chomsky, 1995a), I retain the label distinction between heads and phrases, because they do not share the same syntactic behaviour (e.g. 'head-to-head movement' is of heads, and *wh*-movement is of phrases). Heads may be modified by elements in a specifier position SPEC, XP (Chomsky, 1970) and are in a sister relation to their complements YP. The functional category Determiner (D) may merge with the lexical projection NP to produce an extended nominal projection DP with referential and quantificational properties (Abney, 1987), whilst the functional category Inflection (I) may merge with the lexical phrase VP to produce an extended verbal projection IP with properties of tense and aspect (Chomsky, 1981). IP may in turn be embedded in a complementizer phrase CP, following standard assumptions. Whether there are multiple functional categories in extended nominal projections, verbal projections, and complementizer projections, or whether a more restrictive account is to be preferred, is generally outside the scope of this investigation.[10]

In respect of semantic features, it should be clearly understood that the features to be proposed here do not contribute in any way to a definitional theory of meaning: the meaning of a lexical item is not seen simply as the sum of its grammatically-relevant semantic features. The features discussed here are exclusively

[10] Following Pollock (1989), some researchers assume that IP should be split into independent functional categories such as Tense (T) and Subject Agreement (AgrS), and debate continues on this issue (Chomsky, 1995, 2000a; Guasti and Rizzi, 2002). The term TP is now used both by proponents of a split system and by those in minimalism who have returned to the idea of a unitary projection. The term IP will be maintained here, due to its general applicability across generative frameworks: however, nothing in this thesis hinges on my assumption that it is indeed a unitary projection. Similar issues obtain for extended nominal projections. For discussion of DP projections, see e.g. Cardinaletti and Giusti (1991), Ritter (1995), Giusti, (2002). For split CP, see Rizzi (1997).

those aspects of lexical meaning that contribute to syntactic computation. As an example of syntactic relevance, Levin (1991: 5-11, 25-26) argues that only verbs that express CHANGE (of state or location) may participate in the middle construction, as shown below:

(3.41) a. Yoko {cuts / tears / moves / slides} the paper.
b. The paper {cuts / tears / moves / slides} easily. (CHANGE)

(3.42) a. Yoko {touches / hits / examines / adores} the paper.
b. *The paper {touches / hits / examines / adores} easily. (*CHANGE)

Despite considerable agreement in the linguistics literature that lexical items have components of meaning that play a determining role in syntax, there is considerable variation in the names, representations, and exact roles of such meaning components, depending on the theoretical framework. Syntactically relevant aspects of meaning such as CHANGE are variously referred to as *interpretable syntactic features*, *semantic components*, or *conceptual elements*, depending on the theoretical approach. In this thesis, the term 'computational semantic features'[11] (or just 'semantic features') is to be understood in the following way.

(3.43) *Computational semantic features* are those elements of lexical meaning that play a role in syntactic derivations.

[11] Thanks to Bonnie Schwartz for suggesting this term.

The computational semantic features of this analysis correspond in most cases to 'interpretable syntactic features' in Emonds (2000); 'meaning components' in Levin (1993); certain 'semantic elements' in Talmy (1985); certain 'ontological categories' or 'conceptual functions' in Jackendoff (1990); and parts of Pinker's (1989) 'grammatically-relevant semantic subsystem'. Those relevant to motion events include: MOTION, MANNER, LOCATION, PATH, and PLACE. Despite the fact that all computational semantic features are 'conceptual', I avoid this term in the characterization of syntactically relevant semantic features, because only a small subset of conceptual elements interact with the grammar. The range of conceptual elements that could, logically speaking, be incorporated into the computational systems of human languages is vast: however, as Talmy (1985) makes clear, many conceptual notions appear never to be *systematically* encoded in the lexical entries of predicates. Verbs and adpositions can never be grouped together in terms of shared syntactic behaviour with reference to e.g. (i) the attitude or state-of-mind of the speaker; (ii) the speed of a moving object; (iii) the rate of a change in a change-of-state event; (iv) the colour of objects; or (v) the physical properties of the environment of the event (temperature, indoors or outdoors, day or night). These concepts can of course be lexicalized (e.g. (i) *loiter*; (ii) *gallop*; (iii) *accelerate*; (iv) *blacken*; (v) *simmer*), but their lexicalization does not determine in any way the syntactic environment of the predicate, so they are not computational semantic features by this definition. Thus if two lexical items differ in meaning but do not differ in syntactic behaviour, then they differ in conceptual features but not semantic features.

Prior to the articulation of a theory of PATH representation, several preliminary definitions will now be given in order to facilitate discussion. In subsequent

argumentation, unless specifically stated otherwise, the term PATH is to be understood in the following way:

(3.44) PATH: A semantic feature specifying directional interpretation, carried on lexical or functional heads in syntax.

Henceforth, reference to PATH verbs or PATH pre/postpositions indicates that such Vs or Ps carry PATH as an inherent feature, i.e. they are inherently directional. The most important subtypes of PATH verbs in this study are as follows.

(3.45) Geometric V [PATH]: A verb necessarily expressing directional movement in the context of a particular spatial configuration, e.g. E: *cross*, *enter*; F: *traverser* 'cross', *entrer* 'enter' J: *wataru* 'cross', *hairu* enter'.

(3.46) Deictic V [PATH]: A verb necessarily expressing directional movement towards / away from the speaker or an event participant, e.g. E: *go*, *come*; F: *aller* 'go', *venir* 'come'; J: *iku* 'go', *kuru* 'come'.

Directional MANNER verbs are here considered to be distinct from the two verb classes above, in that they do not carry an inherent PATH feature; rather, they select PATH as a feature of their complements.

(3.47) Directional V [MANNER]: A verb expressing manner of motion, in an unspecified direction (the direction may be specified by a PATH complement), e.g. E: *run*, *swim*; F: *courir* 'run', *nager* 'swim'; J: *hashiru* 'run', *oyogu* 'swim'.[12]

Verbs may also carry both MANNER and PATH features:

(3.48) V [MANNER, PATH]: A verb expressing both manner of motion and directional movement in the context of a particular spatial configuration, e.g. E: *plummet*, *tumble*; F: *grimper* 'climb {up / *down}'; *dévaler* 'hurtle {down / *across}'; J: *noboru* 'climb {up / *down}'; *ochiru* 'fall'.[13]

Spatial pre/postpositions throughout this thesis are referred to in terms of three types, according to whether they allow both locational and directional interpretations, or are restricted to one or the other:

(3.49) P [LOC]: A spatial pre/postposition which permits either locational or directional interpretation, e.g. E: *in*, *under*; F: *à* 'at' or 'to', *dans* 'in' or 'into'; J: *ni* 'at /in / on', or 'to / into / onto'.

(3.50) P [PATH]: A spatial pre/postposition which permits only directional interpretation, e.g. E: *to*, *from*; F: *par* 'via'; J: *e* 'to', *kara* 'from'.

[12] Apparent counterexamples such as 'running on the spot' I take to be metaphorical, and not really instances of 'running'.
[13] The conflation of MANNER and PATH in a single verb is relatively uncommon, but worthy of note. I discuss this form of LI in more detail in the introduction to Section 5.2, and again in sections dealing with language-specific results of Experiment 1: 5.2.1, 5.2.2, and 5.2.3. See also Sections 6.4 and 6.5.

(3.51) P [PLACE]: A spatial pre/postposition which permits only locational interpretation, e.g. E: *within*; F: no examples of this type; J: *de* 'at / on / in'.

As mentioned above, these feature-based definitions are given here to simply to lend precision to discussion of the experiments in the following chapters, and may be easily converted into alternative notational frameworks. Argumentation to support this feature-based approach will be elaborated in Chapters 10 and 11, as will the clarification of complicating factors such as ambiguity between locational and directional interpretations of prepositions. These issues will temporarily be put on ice.

In these first three chapters, the discussion has been of a preliminary nature, in preparation for a fresh empirical investigation of Talmy's binary typology in the expression of PATH in motion events (Talmy 1991; 2000b). First, the typology of 'satellite-framed' and 'verb-framed' languages was presented in the context of the cognitive linguistic terminology that defines it. It was shown that whilst initial investigations appeared to confirm the binary nature of the typology, more recent work has revealed complications in the classification of languages in this regard. Solutions proposed include a ternary typology (Slobin, 2004) and clines of PATH salience (Ibarretxe-Antuñano, 2003). The alternative perspective of this thesis was then made clear: formalization of PATH predication on the basis of grammaticality rather than frequency of rhetorical styles. The second chapter considered two routes to formalization. The first is in terms of variation in language types, recasting Talmy's typology as a parameter in the P&P framework (Chomsky, 1981). On this account, each language instantiates a 'setting' of the parameter. The second is in terms of variation in the properties of LIs, so that the purported variation across languages is of the same ilk as variation within individual languages. On the latter account, the

typology remains as a statement of general tendency, but formalization is only possible at the lexical level, not at the level of whole languages. In the third chapter, it was argued that in the absence of a Universal Lexicon, an experiment cannot be set up in such a way as to examine the acquisition of one LI in three languages holding all variables constant; rather, crosslinguistic analysis is only possible if the design enables the test subjects to furnish comparable results, as subjects draw similar but non-identical LIs from independent lexicons. As both the semantics and the subcategorization properties of LIs are relative to language-particular lexicons, comparison is possible only at the sub-lexical level. The syntactic and semantic terms to be used in empirical investigation were then provided, in order to ensure a degree of clarity in terminology. We now turn to experimental research, enabling closer examination of directional predicates in English, French and Japanese.