

What Else Transfers?

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1. Introduction

In his seminal paper on the ‘fundamental difference’ between first and second language (L1 and L2) acquisition, Bley-Vroman (1990) proposed that this disparity is due to the lack of continued access to Universal Grammar and the unavailability of ‘domain-specific learning procedures’ beyond a critical period in child language development. He considered four possible alternative accounts of this difference, arguing that each falls short of providing a convincing explanation: (i) the input hypothesis; (ii) the affect or socialization hypothesis; (iii) competing cognitive systems; and (iv) L1 interference. Whilst various interrelated factors are needed to comprehensively explain the many differences between L1 and L2 acquisition, this paper argues that the importance of (iv) is still significantly underestimated. Despite the increased importance attributed to in syntactic and phonological transfer in recent years (Schwartz and Sprouse, 1994, 1996; Archibald, 1998; Brown, 2000), transfer accounts have largely ignored the acquisition of the lexicon. If lexical representations are not universal but relative, and if the L1 lexicon constitutes the initial state of the interlanguage lexicon (Sprouse, 2006), then L2 lexical acquisition involves the relexification of the entire L1 lexicon, with all the syntactic information it contains. This paper re-examines the role of the L1 lexicon in L2 acquisition, and suggests that the problem of relexification goes a considerable way toward explaining L2 learners’ general lack of convergence on the target language. In Section 2, I review the basic tenets of the Fundamental Difference Hypothesis, and consider the growing emphasis on the role of the L1 in L2 research. Sections 3 and 4 present two concepts which are pivotal to the understanding of lexical acquisition in a second language: lexical relativity, and lexical transfer. The implications of these two phenomena are considered in Section 5, in terms of four types of L1-L2 lexical mapping problems. Finally, the learnability problem is set in the light of the vastness of the task of vocabulary acquisition.

2. The Fundamental Difference Hypothesis and L1 Transfer

2.1. *The fundamental difference hypothesis and its alternatives*

Bley-Vroman’s (1990) proposal of the Fundamental Difference Hypothesis was embedded in a paper that set out with great clarity the characteristics of L2 acquisition, as well as the parameters within which L2 theories have been elaborated. As such, its continuing relevance to L2 theory-building is well-accepted. However, its central thesis is much more controversial. The basic proposal may be schematized as follows:

Table 1. The Fundamental Difference Hypothesis (adapted from Bley-Vroman, 1990: 14)

	HYPOTHESIS SPACE	LEARNNG MECHANISMS
L1 ACQUISITION	Universal Grammar	Language Acquisition Device
L2 ACQUISITION	L1 knowledge	General problem-solving skills

On this account, L1 development is guided by an ‘innate domain-specific acquisition system’, comprising knowledge of Universal Grammar (UG), which delimits the possibilities for a natural human grammar, and ‘domain specific learning procedures’ (akin to Chomsky’s (1965) ‘Language Acquisition Device’, or LAD), which make possible the acquisition of ‘an abstract formal system of great complexity; one which is, furthermore, underdetermined by the data of experience’ (Bley-Vroman, 1990: 13-14). In contrast, L2 development is argued to differ in that *a priori* knowledge of

possible grammatical principles is restricted to those actually instantiated in the L1, while learning is possible not through the LAD but through problem-solving systems active in more general domains of cognition.

In keeping with his goal of mapping out the theoretical territory, Bley-Vroman (1990) considers four alternative types of account that might explain the observed differences between L1 and L2 acquisition, and gives reasons why each is inadequate. *The input hypothesis* suggests that adults are not exposed to enough input or to the right kind of input; Bley-Vroman counters that the variation across learners with the same kind of input and general failure even with decades of exposure speak against this kind of solution. Moreover, the notion that there might be a psychological ‘filter’ operating in adults (Krashen, 1982) has not been elaborated to the extent that it can usefully help to define a model of L2 acquisition (see Gregg, 1984, for further discussion). *The affect or socialization hypothesis* maintains that children have a personality type, set of attitudes or general social buoyancy which gives them an advantage over adults; Bley-Vroman rightly argues that this vague idea does not address the range of variation in the personalities of children, who almost invariably converge on the target language, and adults, who almost invariably do not. The hypothesis of *competing cognitive systems* (Felix, 1985) advances the idea that when children enter the formal operational stage of cognitive development (Inhelder and Piaget, 1958), the general problem-solving system competes with and takes precedence over the LAD. Bley-Vroman points out that this account implies that learners with poor attitudes, low motivation, and a suppressed problem-solving system should rely more on the LAD and be better language learners, which is not the case. Furthermore, some of the most impressive L2 learners begin acquiring an L2 in early adolescence, just at the time the two systems enter into supposed competition. Finally, *the L1 interference hypothesis* suggests that having an L1 already represented in the mind either impedes or renders impossible ‘complete success’ in L2 acquisition. Bley-Vroman refers to the much disparaged behaviorism underlying one early theory of transfer in the context of Lado’s (1957) Contrastive Analysis framework, and cites a claim prevalent in the morpheme order studies of the 1970’s: ‘interference accounts for perhaps 5-25% of grammatical errors’ (Bley-Vroman, 1990: 24). However, these figures must be treated with caution: they are speculative, and were suggested in the general context of studies seeking to show that L2 acquisition is essentially the same as L1 acquisition, a claim that has been largely discredited.

2.2. L1 interference reconsidered

Since the publication of Bley-Vroman’s (1990) article, the role of L1 interference has been re-evaluated by several researchers, and reinstated as a significant factor in explaining patterns of L2 acquisition. Empirical studies have painted a more detailed picture of the broad range of L1 effects, and many have converged on the idea that the initial state of the IL is determined by full transfer of the L1 grammar (Schwartz and Sprouse, 1994, 1996). That said, in the absence of agreement as to the domain of ‘L1 grammar’, what transfers remains controversial. For example, Montrul (2000) analyzed causative/inchoative alternation patterns in the L2 acquisition of Spanish (L1 English and L1 Turkish) and Turkish (L1 English and L1 Spanish). In the following Spanish example, it can be seen that root form is causative, and that the inchoative requires an anticausative morpheme.

- (1) a. El ladrón rompió la ventana.
the thief broke the window
‘The thief broke the window.’
- b. La ventana se rompió.
the window ANTICAUSE broke
‘The window broke.’

In Turkish, for most verbs, the root is inchoative, and the causative requires overt morphology, but a subset of verbs patterns like Spanish, with a causative root and anticausative morphology.

- (2) a. Hırsız pencere-yı kır-dı
thief window-ACC break-PAST
‘The thief broke the window.’

- b. Pencere kır-ıl-dı
 window break-PASS-PAST
 ‘The window broke.’

Montrul (2000: 235)

Montrul (2000) argued that learners do not transfer argument structures from L1 verbs (or verb classes), but rather they are sensitive as to whether the L2 has overt morphology, in this case anticausative morphology, on a par with the L1. For both L2s, learners whose L1s overtly marked the inchoative performed liked native speakers in rejecting sentences without overt morphology, whilst learners whose L1 lacked such morphology accepted non-target-like forms without the appropriate morphemes. However, on reconsidering these interlanguage data, Whong-Barr (2005, 2006) argues that they do not necessarily constitute evidence against L1 transfer of argument structure; subsequent overgeneralizations might benefit from analysis in terms of the developmental process rather than the initial state, and in terms of derivation rather than representation, as L1 syntactic processing routines remain. Whong-Barr (2006) also notes that this view of modular transfer begs the questions of the precise nature of such modules, and why some but not other sub-modules of the language faculty should be subject to transfer. It seems unlikely that of the L1 grammar, only argument structure is left behind. Evidence from other studies suggests that the lexical representations of predicates do, in fact, transfer.

2.3. *Accumulating evidence for transfer of lexical semantic representations*

Studies of the L2 acquisition of argument structure to date generally point to L1 lexical influence in at least the following areas of predicate-argument structure. In the case of datives, Japanese disallows double-object constructions in general; Korean disallows dative double objects, but allows benefactives. Korean and Japanese learners of English pattern the same with regard to their acceptance of dative double objects, but differ in their acceptance of benefactives (Whong-Barr and Schwartz, 2002). In the case of locatives, Schwartz, Dekydtspotter and Sprouse (2003) show how results obtained by Joo (2000) are consistent with L1 transfer of argument structure. Korean analogues of ground-oriented English locatives always alternate (Kim, 1999), and interlanguage representations appear to begin as alternators too. In the case of psych verbs, French and Japanese learners of English differ in their acquisition of experiencer-object psych verbs; this is plausibly due to differences in L1 morphology (White, Brown, Bruhn de Garavito, Chen, Hirakawa & Montrul, 1999).

Whilst such studies have made significant inroads into the field of lexical transfer, this issue remains relatively under-explored, given the quantity of lexical items to be acquired, and the complex cross-classification of predicates in terms of semantically determined classes with particular patterns of syntactic behavior (Levin, 1993). In order to appreciate the nature of the task facing L2 learners, and to go some of the way toward explaining the apparent fundamental difference between L1 and L2 acquisition, discussion now turns to two key concepts in L2 lexical acquisition: lexical relativity and full lexical transfer.

3. Lexical Relativity

3.1. *The Lexical Relativity Hypothesis*

Occasionally, the idea surfaces that open-class lexical items in the world’s languages are drawn from a universal lexicon, in turn drawing on a universal set of concepts. For example, Chomsky (1995: 131) writes: ‘*If substantive elements (verbs, nouns, etc.) are drawn from a universal vocabulary, then only functional elements will be parameterized.*’ (my italics) This notion is also found in the work of Fukui (1995), and finds extreme expression in Fodor (1998). However, evidence abounds that the opposite is true: in contrast to universal principles of syntax and phonology, lexical items are relative to language-particular lexicons, rendering morpheme and lexeme translation possible only in terms of degrees of approximation.

Lexical equivalence is virtually non-existent in part because both denotational and syntactic properties of words are constrained by those of other words in the same combinatorial system. Saussure (1983 [1916]) 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* (p.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 (p.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 in contrast with one another. ‘...although in general a difference presupposes positive terms between which the difference holds, in a language there are only differences, and no positive terms’ (p.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 (p.118-9). However, as Bloom (2000: 73) notes, opposition in and of itself is insufficient to characterize lexical meaning. Whilst words in a given relational set may be characterized with reference to one another, the opposition between totally unrelated lexical items does not contribute to our understanding of the meaning or syntactic behavior 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. Stringer (2005: 90) provides the following statement of the Lexical Relativity Hypothesis.

- (3) When comparing lexical analogues in different languages, the meaning of any lexical item (LI) is relative to its ambient lexicon.

Recasting lexical relativity in positive terms, three kinds of conceptual variation may be considered: 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 latter two are examples of what I have elsewhere called ‘computational semantic features’ (Stringer, 2005: 101), and have been labelled in various ways in the literature: ‘interpretable syntactic features’ in Emonds (2000); ‘ontological categories’ or ‘conceptual functions’ in Jackendoff (1990); ‘meaning components’ in Levin (1993); the ‘grammatically-relevant semantic subsystem’ in Pinker (1989), and certain ‘semantic elements’ in Talmy (1985).

3.2. *Lexical relativity in the denotational properties of nouns and verbs*

Conceptual elements that play no role in syntax may be readily observed 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. Modern inventions seem good candidates for lexical universals, yet the English noun *television* has no exact equivalent in German: *der Fernseher* refers to the machine, while *das Fernsehen* refers to the medium.

Similar mismatches are apparent when pairs of corresponding verbs are subjected to scrutiny. Drinking is as universal a human activity as one could find, yet the English verb *drink* is used only of liquids; in Turkish, the analogous verb may be used of smoke; in Japanese, of medicinal pills, even if swallowed dry.

3.3. *Lexical Relativity at the interface with syntax*

As regards computational semantic features, adpositional systems provide striking examples of non-equivalence. In order to show that Spanish grammar does not allow directional phrases such as *into the*

room to merge with manner verbs such as *run*, Hohenstein, Naigles and Eisenberg (2004: 572) give the following examples.

- (4) a. The children ran
b. The children ran into the room.
- (5) a. Las niñas corrieron.
b. *Las niñas corrieron hacia adentro del cuarto.

They adopt a language-specific syntax approach, arguing that: ‘...the issue with Spanish is that it lacks the requisite rule, so that Spanish manner verbs cannot always appear with the same directional phrases’ (p.572). However, the explanation for such facts may be much simpler: Spanish lacks a lexical analogue of *into* bearing the semantic features necessary (i.e. PATH, or direction) to allow a merger with the verb *correr* ‘run’. The phrase *hacia adentro de* does not exist in Spanish, and was coined by these authors as the paraphrase closest to the English preposition. However, these items in Spanish have their own syntax and semantics. *Hacia* ‘towards’ is an unbounded, transitive preposition, and can, in fact, be merged with a MANNER verb, e.g.

- (6) Las niñas corrieron hacia el cuarto.
the girls ran towards the room
‘The girls ran towards the room.’

Adentro ‘inside’ is an intransitive preposition, which also may be used with ‘satellite-framed syntax’. Thus example (7a) is possible, but (7b) is impossible.

- (7) 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.’

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

- (8) Las niñas estaban dentro del cuarto.
the girls were inside of-the room
‘The girls were inside the room.’

It seems clear that the Spanish concatenation *hacia adentro de* cannot be considered a lexical equivalent of English *into*, and the impossibility of merging it with a Manner verb cannot serve as the basis for the claim that Spanish grammar lacks a ‘requisite rule’. English *into* has no lexical equivalent in Spanish.

Another example in the domain of adpositions concerns their representations in terms of spatial geometric features, in ways which seem to make plausible the notion that a subset of such features play a role in argument selection (Pinker, 1989). For example, the English preposition *across* has no one literal translation in Japanese, but may be translated by either the verb *wataru* or the verb *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 English *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.

- (9) L'arbre se trouvait en travers de la rue.
 the-tree REFL find-IMP Ploc crosswise of the road
 'The tree was lying across the road.' (i.e. 'The tree was blocking the road.')
- (10) 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.'

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, (12) indicates that the window was broken on entry.

- (11) 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)
- (12) Le voleur est entré à travers la fenêtre.
 the voleur AUX entered Ploc 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'. 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.

4. Full Lexical Transfer

The second concept which helps us understand the degree to which lexical learnability issues contribute to the fundamental difference between L1 and L2 learners is that of Full Lexical Transfer. This idea is discussed lucidly by Sprouse (2006), who argues that what transfers is not only L1 parameter settings, but the L1 lexicon, with all its idiosyncratic combinations of sound (phonemes, phonological features), and meaning (lexemes, semantic features). He suggests that the Relexification Model of Creole Genesis, proposed by Lefebvre (1998) to account for the development of Haitian Creole, serves as an excellent model of L2 acquisition of the lexicon (whether or not it is an accurate description of creole formation). The general process is schematized in Table 2.

On this model, lexical items (both open- and closed-class) are all available for transfer, on condition that an L2 analogue is identified. On the basis of perceived phonological input, the learner re-labels the L1 representation, with the result that the newly acquired lexical item has exactly the same syntax and semantics as the L1 equivalent. Thus in the case of verbs, irrespective of whether the target item assigns a certain case, or has a certain valency, or participates in particular alternations, the interlanguage item will behave according to L1 specifications.

If this approach is correct, as strongly suggested by what we already know about the transfer of argument structure (see Section 2.3), then the implications for L2 acquisition are profound. As lexical semantics determines aspects of syntax, non-target-like argument structures are a product not of transfer of lexical parameter settings (Juffs, 1996; Inagaki, 2001), but of lexical transfer. Given lexical relativity, the syntax and semantics of the entire L1 lexicon must be entirely reanalyzed (item by item, or class by class) in the creation of the interlanguage lexicon. This general approach is in line with the Minimalist account of morphosyntactic variation as encoded in the lexicon (Chomsky, 1995, 1998).

Table 2. The Relexification Model of Creole Genesis as a model of L2 acquisition (Sprouse, 2006, after Lefebvre, 1998)

phon _i sem _k syn _i	+	[phonetic string] _j (perceived in semantic / pragmatic context)	=	phon _{p(j)} sem _k syn _i
L1 lexical entry	+	Lexifier language input	=	New lexical entry

5. Specific types of L1-L2 lexical mapping problems

Some implications of the twin concepts of lexical relativity and Full Lexical Transfer can be seen when we consider various types of lexical mismatches. Four such types are briefly exemplified below.

5.1. Differences in inherent semantic features

It might seem natural for an English learner of Korean to ask what the equivalent of the English verb *put* is. If an analogue is supplied by an interlocutor or by means of a dictionary, the English lexical representation will then be re-labelled with the perceived Korean phonology, and retain selectional features such as CONTACT or CONTAINMENT. However, there is no equivalent of the verb *put* in Korean. In putting contexts, Korean uses verbs such as *kkita* ‘to fit tightly’, *nehta* ‘to fit loosely’, *nohta* ‘to put on a horizontal surface’, *pwuchita* ‘to juxtapose surfaces’ or *ssuta* ‘to put clothing on the head’ (Bowerman and Choi, 2001: 483).

5.2. Differences in syntactic subcategorization

French learners of English must learn that even though conceptualizations of events involving ‘entering’ and ‘putting’ may be very close, the English verb *enter* selects a direct object in English, and the verb *put* obligatorily selects an indirect object. Both cases contrast with French, where *entrer* ‘enter’ obligatorily selects a PP headed by *dans* ‘in’, and *mettre* ‘put’ exhibits optionality in the overt realization of the indirect object. An interesting question is whether transfer is equally strongly in both directions: from optional to obligatory and vice-versa (thanks to Shigenori Wakabayashi for raising this issue). The theory as sketched above would predict problems in both directions, but empirical evidence is lacking on this point.

5.3. Differences in transitivity

In a similar case, a verb that is transitive in the L1 may have an analogue that is intransitive in the L2 (the core semantics also invariably differ in such cases). For example, English *play* may be used in transitive frames (selecting either games or music), whilst the most common analogue in Japanese, *asobu*, is only used intransitively. Moreover, its meaning is closer to ‘enjoy oneself’ or ‘have fun’ as can be seen in the following example.

- (13) Uchi ni asobi-ni-kite kudasai
house Ploc play-Part-come please
Literally: ‘Please come and play at my house.’
Intended meaning: ‘It would be lovely (fun) if you could visit me sometime.’

5.4. Differences in syntactic alternation patterns

As a final example, a verb that participates in a syntactic alternation in the L1 may map onto a verb that does not alternate in the L2. The Japanese verb *mitasu* ‘fill’ may select either the moved element (FIGURE) or the location (GROUND) as in the direct object. Its usual English analogue, *fill*, strictly maps the GROUND onto the direct object position.

- (14) a. Taro-ga o-sake de gurasu-o mitashita.
Taro-NOM HON-sake with glass ACC filled
‘Taro filled the glass with sake.’
- b. Taro-ga gurasu ni o-sake o mitashita.
Taro-NOM glass LOC HON-sake ACC filled
‘Taro filled sake into the glass.’
- (15) a. Taro filled the glass with sake.
b. *Taro filled sake into the glass.

6. Conclusion

Research in the wake of Bley-Vroman’s (1990) classic statement of the explanatory burden on L2 theory has led to a reconsideration of one of the ‘alternative explanations’ that he rejected: the L1 interference hypothesis. The above argumentation highlights the need to supplement influential work on transfer of syntax and phonology (Schwartz and Sprouse, 1994, 1996; Archibald, 1998; Brown, 2000) with an articulate theory of lexical transfer. The twin assumptions of (i) Lexical Relativity and (ii) Full Lexical Transfer go a significant way toward explaining the ‘fundamental difference’ between L1A and L2A, continued access to Universal Grammar notwithstanding. As a final thought, it is worth considering the size of the task. How many words must L2 learners relexify in order to achieve native speaker competence? Estimates of the size of the English mental lexicon vary considerably; Bloom (2000: 6) calculates that people who read a lot might have as many as 150,000 words in their heads. Even if word classes and lexical redundancy rules have psychological reality (which is an open question), the task is vast. On this account, even though universal principles and domain-specific learning procedures might remain in place, the chances of complete convergence on the target language are slim, as lexical acquisition requires an abundance of appropriate input and a daunting expanse of time.

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