

## A NEW ACCOUNT OF LANGUAGE TRANSFER\*

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### Introduction

Many of us have, for some time, thought of transfer as a process. Transfer was something that the learner did. In fact, the very word itself implies some sort of a process. We say 'the learner transferred' a structure, phone, lexical item from one language to another, and, when we do, we envision some sort of action or movement, even though it may be abstract action or movement.

My current view is that transfer is not a process at all, and is in fact a misnamed phenomenon - an unnecessary carryover from the heyday of behaviorism. What is currently viewed as evidence for the process of transfer is more appropriately viewed as evidence of a constraint on the learner's hypothesis testing process. It is both a facilitating and a limiting condition on the hypothesis testing process, but it is not in and of itself a process.

In order to explicate this new notion of transfer, however, it is first necessary to sketch an account of the framework or perspective from which I view it, that is, to provide a characterization of the hypothesis testing process itself, so that this new explanation of transfer is made clear in terms of its relationship to the hypothesis testing process.

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Surprisingly, although many researchers in second language acquisition assume such a process (we often adopt the Dulay and Burt (1974) term 'creative construction' to refer to it) little attention has been paid to what it might imply. Two questions need to be addressed. What do we mean when we say that adults learn second languages by formulating hypotheses and testing them against the data available to them? What ontological commitments are we making when we do so?

What is needed, in fact, is a model of adult second language acquisition which has at least the following characteristics: it explicates the notion that adults learn second languages by formulating and testing hypotheses; it incorporates an adequate account of transfer; it illuminates a large array of the facts currently available to us.<sup>1</sup>

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<sup>1</sup>Such a model will, of course, have to fulfill other conditions, not the least of which are: to provide an explanation of the fact that while children almost universally reach native speaker proficiency in their first language, adults rarely do so in their second language; and to account for data of adult learner production which appears to be developmental. This, however, is a book on language transfer, and I will not address these issues here.

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What I propose to do here is to present a candidate model, one that has the characteristics mentioned and thus deserves further study. It is my adaptation -- to adult second language learning -- of a model developed originally to account for adult concept learning. The model rests on the work of psychologists such as Bruner, Goodnow, Austin (1956), Restle (1962), Estes (1960) and others, but was developed explicitly by the cognitive

psychologist marvin Levine (see Levine 1975). He calls it 'Hypothesis theory' or simply 'Htheory'. The idea of taking a model developed to account for adult human concept learning and adapting it as an account for adult human second language learning rests on the assumption that there are significant similarities between them, and that the differences are not as significant as had previously been supposed. It is my claim that this is the case, <sup>but</sup> to present the arguments in depth would require another paper. Not having that luxury, what I will do is diverge from the main goal of the paper long enough to present a few of the similarities and claimed differences between language learning and concept learning, and then return to an account of the model within which this new notion of transfer is to be explicated.

#### Adult Concept Learning and Language Learning: Similarities and Differences

The most obvious similarities reside in the characteristics of the learners. Both groups are adults, and thus do not present the problem of comparing cognitively mature and immature populations. In addition both groups already know one language or more, and thus can take advantage of this knowledge in approaching the new learning task, even though for concept learners the knowledge of a language will be less relevant than for language learners.

The less obvious similarities involve the task and the situations the learners must deal with. With regard to the task itself, the similarity is exhibited by the fact that at the outset, in both concept learning and language learning, the subject does not know, except in a very general way, what it is that must be learned.<sup>2</sup> The task in both cases is to scan the

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<sup>2</sup>This kind of learning problem, in which the subject does not know what the solution will be but has available certain principles for discovering it, may be contrasted with learning problems in which the solution is known at the outset and the task is to figure out how to arrive at the solution.

input and identify its dimensions, then to observe the regularities and isolate the relevant dimensions, and finally to generalize from those relevant dimensions.

With regard to the situations in which the task is attempted, it is the case that in both concept learning and language learning two situational variables are crucial: one involves the subject's control over the input and the other the provision of feedback to the subject. In concept learning there exist two basic variations on the subject's control over the input, each of which has situational analogs in language learning. In one variation the subject has no control over the input and must extract information from data the subject may or may not be prepared to deal with (listening to a lecture, for instance). The obvious analogy in language learning is exhibited by the situation in which the learner is faced with a stream of speech from the native speaker which is not regulated in any way to accommodate the learner, such as when a native speaker in one-on-one conversation does not realize the limits to the subject's proficiency or when the native speaker is addressing a primarily native-speaking group (lecture, radio, TV, etc.). In the other variation (called the Selection Condition experiment in the experimental literature) the subject can choose a certain dimension (or subset of dimensions) and test them out in the manner that seems most productive to the subject, not an outside controller (learning to operate a computer by interacting with it, for instance). In similar fashion the language learner can formulate and produce sentences and then wait and see if native speakers respond in the way the learner predicts they will (i.e., if the learner expected a yes/no response, did she get one?).

There are also, in concept learning, two basic variations on the provision of feedback, each of which has situational analogs in language learning. In one variation, no feedback is provided (these are called Blank Trials in the experimental literature), thus leaving the subjects in the position of having to make their own assumptions about how well they are doing (this might be the case, for example, in trying to learn geometry from a textbook in which exercises are provided, but no answers). Lack of feedback on form, particularly negative feedback, is common in naturalistic language learning situations as the native speaker will often tolerate grossly deviant sentences from the learner, especially when the learner and the native speaker do not know each other well. In the second variation, the subject receives feedback (Right or Wrong) after each attempt (a computer, for example, will provide feedback after each attempt at interacting with it). Consistent feedback after each utterance is probably nonexistent in naturalistic language learning, but it may be a typical teacher behavior in the classroom during certain drills. However, recent work on negative feedback (cf. Day, Chenoweth, Chun, Lupescu 1981) indicates that more feedback occurs than had previously been claimed to occur (cf. Long 1981) in nonclassroom language learning situations.

In The Psychology of Communication (1967) George Miller presented a summary of the differences between concept learning and language learning as he saw them then, a summary which was no doubt influential in discouraging others from exploring the possibility of similarities between the two. It is certainly cited by others as providing convincing arguments against such an approach (cf. Braine 1971, Wason and Johnson-Laird 1972). But

viewed from the perspective of adult second language learning, some of the most crucial differences disappear, since they apply to child first language learning, but not to adult second.<sup>3</sup> Of the differences that are

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<sup>3</sup>Some of the differences Miller pointed out (between child first language learning and adult concept learning) I have actually listed as similarities when comparing adult second language learning and adult concept learning.

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applicable in this case, three deserve discussion.

The first is that in a concept learning experiment the things to be learned are typically presented visually, not verbally, thereby emphasizing different kinds of patterning. This looks to be a possibly serious objection since if it were true the insights derived from concept learning experiments would not be applicable to the language learning case.<sup>4</sup>

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<sup>4</sup>If it were true that visual and verbal learning really emphasized different kinds of patterning, this would be useful to know. I venture to guess that most adults who learn languages via the classroom get as much visual as verbal input. What we need are visual language learning studies (in which students learn only through the written medium) to compare with verbal ones to see what, if any, the differences are.

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The only relevant discussion of this matter I know of is by Bever (1970) in which he relates certain visual processing difficulties and certain language processing difficulties to the same underlying and general cognitive restriction. It would be my expectation that such restrictions would indicate a more basic mechanism underlying and constraining in similar ways the processing of both language and vision.

Another claimed difference is that even in artificial language learning tasks -- which on the face of it most closely resemble real language learning -- the experiments do not involve meaning. This is true, but is simply a failure of the experimenters (and also, possibly, inadequate technology). Miller himself suggests several interesting ways of adding meaning to artificial language learning tasks (see also Moeser (1977) for an interesting approach).

The last difference is that the language learner, according to Miller, is acquiring a sensorimotor skill whereas the concept learner is figuring out an abstract cognitive pattern. This claim is only half true: the language learner must accomplish both whereas the concept learner only deals with one. To what extent the sensorimotor aspect of language learning affects the abstract cognitive aspect remains to be tested.

On reflection, it appears to me that the similarities between adult concept and adult language learning are sufficient to pique one's interest, and that the differences, although they must be kept in mind, are not sufficient to force one to abandon the inquiry. One further reservation might be that it is inappropriate to claim that experimental learning studies will explicate what goes on in nonexperimental settings. Braine's response to just such a criticism is worth quoting here: "The claim that pattern learning abilities revealed in the laboratory are actually used in natural language acquisition rests at the moment on the inherent plausibility of the notion that language learners will use, in language learning, any abilities which they demonstrably possess and which would obviously be useful in learning languages" (1971:162).

### The Outlines of Hypothesis Theory

The model, in essence, is quite simple. It involves 1) the notion of hypothesis formulating and testing behavior on the part of the learner; 2) the concept of a universe of hypotheses; 3) various domains within the universe; and 4) the notion of inferencing and sampling behavior on the part of the learner.

The idea that learners formulate and test hypotheses against linguistic input has been with us for some time now and is generally, if not universally, accepted (but see Braine (1971) for arguments to the contrary). Hypothesis testing is, as Katz puts it, "similar in character to theory construction in science but without the explicit intellectual operations of the latter" (1966:274-5). A language learning hypothesis is a prediction that language is organized in a certain way, and can be distinguished from what psychologists call a response set<sup>5</sup> in that the hypothesis is contin-

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<sup>5</sup>Response sets are exhibited by systematic patterns in the behavior of a subject that persist despite disconfirmation.

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gent upon feedback whereas a response set is not. There is strong evidence to show that adults learn concept discrimination and the syntax of artificial languages by formulating and testing hypotheses against the data (cf. Bruner, Goodnow, Austin 1956; Wason and Johnson-Laird 1972; Levine 1970, Miller 1967, etc.). And it is my claim that there is no strong evidence to show that adults learning a second language do otherwise (but see Reber (1967) in which a different interpretation of artificial language learning tasks is presented).



This notion is not a simple one. It involves, minimally, two kinds of inferencing behavior by the learner -- inductive inferencing, in which the learner scans the data, observes regularities in it, and generalizes (that is, formulates a hypothesis) and deductive inferencing, in which the learner tries out the newly formed hypothesis to see if the data she observes are consistent with it (that is, tests a hypothesis). Exactly how hypotheses are formed by the learner is not known. What H theory advocates claim is that the evidence is such that hypothesis formation by the learner must be inferred in order to account for the data (Levine 1975). How hypotheses are tested is an area in which considerable research has been carried out, at least in concept learning, and the information gathered so far is rather surprising. As any scientist knows, for example, the most efficient way to test a hypothesis is to look for disconfirmation of it. Confirmation will not prove the hypothesis is correct, but disconfirmation will prove that it is wrong. Apparently, in concept learning tasks, normal adults (that is, non-scientists) do not do so. They tend to look for verification of their hypotheses, not disconfirmation (cf. Bruner, Goodnow, Austin 1956; Wason and Johnson-Laird 1972). This is not to say they do not take disconfirming evidence into account (as child first language learners occasionally do not), but only that they do not seek it out. Eventually, disconfirming evidence sinks in and the learner is able to take advantage of it in reaching the correct hypothesis. Clearly much work needs to be done here, specifically with language learning, since the whole question of negative data is a crucial one for any hypothesis testing model.<sup>6</sup> This model claims spe-

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<sup>6</sup>Braine (1971), for example, argues that people learn languages without taking disconfirming evidence (negative data) into account. If this were true, any H-testing model would have to be abandoned as an account of language learning since all such models depend crucially on the learner's making use of disconfirmations to alter or reject wrongly formulated hypotheses. The evidence that Braine uses to support his claim, however, is not convincing.

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cifically that disconfirming evidence results in the learner's abandoning the current hypothesis and looking for another. It makes no claims about what kinds of evidence learners look for to test their hypotheses, confirming or disconfirming.

The idea behind the concept of a universe of hypotheses is that the learner brings to the task some notion of the hypotheses that might be worth testing. That set of hypotheses is called the universe. There are at least two sources for those hypotheses. The first source is the knowledge the learner has gained in previous learning in tasks of this kind. The second source is the new learning situation itself. And while the second source, the learning situation, probably has more salience at least at certain times, the first source, previously gained knowledge, is always available to the learner.

The concept of a universe is not that of a static list of hypotheses to be checked out one by one, but rather one which expands as the learner gains experience. That is, as the learner becomes more proficient in the target language, she will develop hypotheses on the basis of experience

with the target, and these will be added to the ever-expanding list of hypotheses available so that while some are being tested and dropped, others are being added. These others, which have as their source the language learning situation itself (the input) might at times result in what are called developmental errors. It should be noted, however, that although the learner has, in theory, the whole universe of hypotheses available at all times, because of such things as disconfirming evidence, the salience of certain hypotheses, etc., the learner may at any point ignore some of the available hypotheses and focus on certain others. In that sense one could say that the set of hypotheses available to the learner contracts as well as expands.

The notion of domains within the universe involves the idea that hypotheses will fall into natural groupings, that is that groups of hypotheses will share certain characteristics, which in Hypothesis theory are called domains, but which linguists might prefer to label abstract categories. The concept of a domain should be a familiar one to linguists. When we talk of the syntactic knowledge (or intuitions) of a language that speakers have, we are talking about their internal organization of sentences into clause types, phrase types, lexical categories, etc. These categories are what, in this framework, are called domains. The work of such psycholinguists as Miller, Bever and others has shown us that there is considerable evidence for such internal structuring of speech.<sup>7</sup>

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<sup>7</sup>I want to make it clear at this point that I am not claiming that speakers 'know' they have these internal categories/domains, but only

that in their behavior that they act in such a way as to lead the investigator to infer that they have such categories/domains. And in exactly the same way psychologists say people act as if they have conceptual domains, linguists say people act as if there are linguistic categories.

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It becomes immediately clear, then, that there must be different shapes and sizes of domains: 1) there are larger and smaller domains (eg., within the domain of main verbs in English, some take complements and some do not; so, 'main verbs that take complements' is a smaller domain than 'main verbs'); 2) there are crosscutting domains (eg., each of the common noun and proper noun domains of English is divided by the concrete noun and abstract noun domains, as are the concrete and abstract noun domains cross cut by the common and proper noun domains); 3) there are simple domains and complex domains, and there are even different kinds of complex domains (eg., conjunctive domains (A and B and C), disjunctive domains (A or B), sequence domains (eg., ABBA, ABAB, etc.)).

In sum, a simple characterization of the model is as follows:

1) the learner has available a universe of hypotheses; 2) the hypotheses are clustered into domains; 3) the learner chooses a domain and samples hypotheses within it; 4) the learner tests the hypotheses against the input.

#### The Transfer Hypothesis

The Levine hypothesis is that "The S infers from the first n solutions the domain within the universe from which the (n+1)th solution will be taken. Then S samples hypotheses from that domain (Levine 1975:271). My

adaptation of the transfer hypothesis is: the learner infers from previous knowledge the domain within the universe from which the solution to the current target language problem will be taken. Then the learner samples hypotheses from that domain.

There are three possible outcomes here. The first is that the learner may choose the wrong domain, either because the input has provided conflicting signs or because the learner has assumed that a preestablished domain of the native language is the relevant domain for the second language. The latter case, but not the former, will be an instance of transfer.<sup>8</sup>

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<sup>8</sup>There may actually be evidence for this kind of transfer in what I call word salad utterances produced by learners which upon attempted analysis provide few or no clues to what syntactic structure the learner was trying to produce. Examples of word salad sentences abound in learner production but one example produced by a learner of English is: "Some American schools could careless even the instructors if our English knowledge and background are inadequate and limited vocabularies as well." The problem with sentences like this one is that the syntac structure is so obscure that semantic interpretations abound. Two possible interpretations for instance are; 1) that some American schools could even employ instructors who are not very knowledgeable since with our inadequate English and limited vocabulary, it wouldn't make any difference; 2) that in some American schools even the instructors could care less if our English knowledge and background are inadequate and we have limited vocabularies as well.

My suspicion is that the researcher has few clues here precisely because the learner's attempt was in the wrong domain.

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The second possible outcome is that the learner may choose both the correct domain and the correct hypothesis, either because the learner has done a good job of analyzing the input or because the native and target language structures are identical and the learner has recognized the fact. The latter, but not the former, will be an instance of positive transfer, of the traditionally identified kind. The last possible outcome is that the learner may choose the correct domain but the wrong hypothesis, either because of a partly mistaken analysis of the input or because of the learner's correctly equating the relevant domains of the native and target languages but incorrectly assuming a hypothesis that would be appropriate for the native language but not for the target language. This latter case is what is generally recognized as transfer error.

This view of transfer carries with it certain consequences that need to be made clear. The first is that the learner's previous knowledge at any point in the learning process will include not only the learner's knowledge of L1, but also any knowledge the learner may have of the target language, including what might be called 'imperfect knowledge',<sup>9</sup> as well as

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<sup>9</sup>I have in mind here the possibility that the learner has constructed a hypothesis which leads to the production of a structure which is neither native-like nor target-like, that is, a typical interlanguage structure. If that hypothesis is in force when a second related hypothesis is being constructed, it may very well influence the form of the second hypothesis.

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the learner's expectations concerning the target language, conscious or otherwise. What might count as a transfer error in this model is considerably more extensive than what many others have claimed. It will include some of what is now called intralingual error data (although I think there is a distinction to be made between a transfer error and a developmental error) as well as some of the prediction data that Kellerman (1979) and Jordens (1977) have identified (that is, behavior that corresponds to predictions that learners of a target language have prior to and during their experience with it, predictions which are independent of the facts of the target language, and which are typically based on knowledge of the native language alone).

Another consequence is that one's L1 knowledge has as much influence on the learning of an unrelated second language as on the learning of a related one. The evidence may differ, and typically does differ, but the influence is still there. Such phenomena as slower learning (cf. Hakuta (1976) on Uguisu's acquisition of articles) and overproduction (cf. Schachter (1974) on avoidance and Schachter and Rutherford (1979) on overproduction), and choice of wrong domain (cf. footnote 8, this article) should be relatively more evident in the data of a learner of an unrelated target, whereas interference (choice of correct domain but wrong hypothesis) and positive transfer (choice of correct domain and correct hypothesis) should be more evident in the data of one who learns a related language.

Furthermore, and most significantly, what is called transfer is,

within this model, simply the set of constraints that one's previous knowledge imposes on the domains from which to select hypotheses about the new data one is attending to. As one learns the target language through this process of observation, hypothesis formation and hypothesis testing, the structure of these domains changes and the learner has available at time<sub>i</sub> a partially different set of domains than at time<sub>i-1</sub>. This leads directly to the last consequence, which is that within this model, transfer can be accounted for without positing it as a distinct process. There is simply no need to infer from transfer data an underlying process of transfer. It can be explicated more simply in terms of such basic concepts as inferencing and sampling behavior, domains and hypotheses, concepts which are needed within the model for other reasons anyway.

#### Transfer Data

Given the model and thus the characterizations of domains, hypotheses, inferencing and sampling behavior, we have available the paraphernalia to account for a large amount of rather disparate-appearing transfer data.

One can envision comparing two hypothetical learners with regard to the acquisition of a particular structure in the same target language along three dimensions: 1) whether<sup>or not</sup> they have the same native language

(and also the same second language for a third target language); 2) whether in the target language they choose the same domain or different domains; and then 3) given their choice of the same domain, whether the hypotheses they select are the same or different. Table 1 displays the various possibilities.



Table 1  
Comparison of Hypothetical Learners Along Three Dimensions

	Native Language	Target Language	
		domain	hypothesis
1.	same	same	same
2.	same	same	different
3.	same	different	
4.	different	different	
5.	different	same	different
6.	different	same	same

Case 1, in which the two learners have the same native language and choose both the same domain and the same hypothesis is, presumably, a typical situation for speakers of language A learning language B. Their previous knowledge is close to identical (I am excluding the possibility of different dialects here) and their experiences with the target language are similar enough for them to arrive at the same hypothesis. But it is not the only possibility. These two learners may very well choose the same domain but arrive at different hypothesis, as in Case 2. That is, they could have somewhat different perceptions of the target language, or somewhat different experiences with it. The most interesting situation would be Case 3, in which two learners with the same native language choose hypotheses from totally different domains, even given comparable exposure to the target language. One would expect this case to occur relatively less frequently than other cases. Case 4 reflects a typical cross-language experience in which the two learners have different

native languages (and let us assume the simplest case, where the native languages are not related) and choose different domains. Cases 5 and 6, in which the learners have different native languages and choose the same domain, reflect the fact that there are linguistic universals and typological groupings, and thus limits to the ways in which languages can differ. Case 6, furthermore, reflects the reality that any two languages, even if they are totally unrelated, will exhibit certain similarities such that it would be possible, on the basis of native language alone, for two speakers of unrelated languages to arrive at the same wrong (or right) hypothesis in the target language, although again one would expect this to occur less often than other cases.

It is important to note at this point that so far I have been interpreting the chart as if the only relevant learner knowledge were native language knowledge. If one were to make probability predictions on the basis of this interpretation one would claim Cases 1 and 4 to be most likely, Cases 2 and 5 next most likely, and Cases 3 and 6 least likely. But if the chart were to be interpreted as if the only relevant knowledge were the target language knowledge, the probability predictions would be quite different. In that case one would expect Cases 1 and 6 to be most likely, Cases 2 and 5 next most likely, and Cases 3 and 4 least likely. Since both native language and target language knowledge are relevant it is advisable to view the chart as quite distinct from probability predictions.

The data that follow are organized so that each numbered set of data is an example of the corresponding numbered case in the chart above. Most

of the data appear in Schachter and Hart (1979).

Case 1, involving Farsi speakers learning relative clauses in English, is a case in which speakers of the same language choose the same domain and also the same hypothesis from that domain.<sup>10</sup>

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<sup>10</sup>I have not had a Farsi-speaking student in any class I've taught who did not do this, and I have had many Farsi speakers as students. Of course it would not be expected of beginning level students who have not yet reached the stage of embedded clause production.

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1.a) Today you can find rural people that they don't have education.

1.b) There is three roads which people can take them to reach Caspian.

The explanation for this is that Farsi is a language in which relative clauses are marked by epenthetic pronouns. There has been some disagreement about the facts of Farsi among several researchers working on relative clause acquisition recently, regarding whether or not the epenthetic pronoun appears when a subject noun is relativized (Gass 1979, Kellerman 1979). My understanding is that there are certain dialects in which the relativized subject is marked as in (1.a) and others in which it is not. In the Tehran dialect, the prestige dialect of the country, it is not so marked. Often, though, when an informant is describing the facts to the unsuspecting linguist, the informant will try to describe what occurs in the prestige dialect rather than the one she actually speaks. If my understanding of the facts is correct, Tehran dialect speakers should produce sentences in English like (1.b) but not like (1.a), and speakers of certain other dialects should produce sentences like both (1.b) and (1.a).<sup>11</sup> For

<sup>11</sup>Gass (1979) has an alternative and interesting explanation involving the claim that there is no epenthetic pronoun in the subject in Farsi, and that the learner transfers the general case to English (direct object, indirect object, object of preposition) and then generalizes to the exception (subject). We await further developments in the study of Farsi dialects.

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Farsi learners of English relative clauses the learner domain in this case is: relative clauses; the learner hypothesis is: to mark a relative clause, add a pronominal reflex of the relativized noun.<sup>12</sup>

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<sup>12</sup>This is, of course, in addition to other relative clause markers, such as the relative pronouns, the position of the relative clause, etc.

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Case 2, involving Arabic speakers learning English passives, is one in which learners with the same native language choose the same domain, but different hypotheses, to fit the facts. In the acquisition of the passive, what I have found among Arabic speakers are two typical error types. The first involves adding an appropriate (tensed) form of be but not adding the past participle form to the main verb.

2.a) Oil was discover in the 19th century.

2.b) Their people is more educate than others part.

The domain for these learners is: the passive construction; the hypothesis is: to mark the passive add a tensed form of be. Examples (2.c) and (2.d) display the second pattern, in which the past participle form of the main verb is used, but no form of be is added.

2.c) But when oil discovered in 1948 and began export it in 1950...

2.d) This theatre built with different design from the others.

The domain for these learners is the same: the passive construction; but the hypothesis they choose is different: to mark the passive use the past participle form of the main verb.<sup>13</sup> Because the data from which these

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<sup>13</sup>It should be noted that the verbs in these sentences are all transitive verbs in Arabic and allow passivization.

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sentences were extracted is cross-sectional, no conclusion can be drawn as to whether or not these two sentence types represent stages in the development of the English passive by Arabic learners. What is known is that none of the 75 Arabic speakers in the data base produced both error types in one sample.

Case 3, in which two learners have the same native language and yet choose different domains may best be exemplified with avoidance phenomena. I have argued elsewhere (Schachter 1974) that Chinese learners of English avoid producing relative clauses because they find them quite difficult. But Chinese learners of English know--at some level--that they are going to have to be able to modify nouns. What can they do? One approach is to continue working on those difficult relative clauses until they are finally mastered, and some learners undoubtedly do this. The other approach would be to find some other way of modifying nouns that wasn't so difficult --noun complements, for example.

Schachter and Hart (1979) speculated that Chinese learners do precisely this: develop and use noun complements to modify nouns as an alternate to using relative clauses. Sometimes this is communicatively successful; other times it results in error, as in (3.a) and (3.b) below.

3.a) There is two kinds of people to visit the museum.

3.b) There is a cascade to drop down a river.

These are Chinese-produced noun complement errors which appear to English speakers as if they should not be noun complements at all, but rather relative clauses (that is, that (3.a) for example should have been "there is two kinds of people who visit the museum."). My claim is that Chinese learners initially make one of two choices: domain<sub>1</sub>, (easy) noun complements, domain<sub>2</sub>, (hard) relative clauses.

Case 4, in which learners of different and unrelated native languages choose different domains, is nicely exemplified by the comparison of Spanish speakers with Arabic speakers on the learning of the modal can. The Spanish speakers typically produce sentences like (4.a) and (4.b):

4.a) The poor people there can to do anything.

4.b) He can't to eat.

Arabic speakers do not do this. They seem to choose both the correct domain and the correct hypothesis. The account for this is that all verbs are main verbs in Spanish; there is no modal subclass. Poder, the Spanish translation of can, is a main verb which, by the way, takes an infinitival complement. So for the Spanish speaking learners of English the domain is: main verbs; and the hypothesis is: can (as main verb) takes an infinitival complement. For Arabic speakers this is not the case since gadar, the Arabic equivalent of can, does in fact belong to a subclass of modal verbs (along with baga 'want', raad 'feel like doing something', huawal and jarrab 'try to do something'). The Arabic case is thus one of positive transfer.

Case 5, in which speakers of different languages choose the same domain but different hypotheses is exemplified in the comparison of the examples in (4) with the examples in (5). Chinese speakers, as opposed to Spanish speakers, produce forms as in (5.a) and (5.b).

5.a) I can working.

5.b) So I can't learning soon.

The Mandarin equivalent of can, neng, can also be viewed as a verb that takes a complement. Why they produce the -ing form is not as present clear. The domain from which the Chinese speakers choose their hypothesis is the same as that of the Spanish speakers: main verbs; they differ only in the form of the complement they choose (that is, in the specific hypothesis), the Spanish choosing the infinitival, the Chinese choosing the gerundive.

Case 6, in which speakers from unrelated languages arrive at not only the same domain but also the same hypothesis, is exhibited by the nonuse of subject pronouns by both Japanese and Spanish speakers. Compare first (6.a) and (6.c) and then (6.b) and 6.d).

Japanese

6.a) Mt. Fuji is world famous looks beautiful.

6.b) In my country hasn't army, navy and air force.

Spanish

6.c) The fountain of work in Venezuela is petroleo; is our principle fountain of work.

6.d) In Venezuela is holiday both days.

It appears that for both Japanese and Spanish learners subject marking is unnecessary once the topic is identified. And of course this is a reflex of subject marking constraints in their respective native languages.

## Conclusion

At this point a recapitulation of the major developments of this paper is in order. We have here an outline of a model of adult concept learning which looks like an excellent candidate for adoption and adaptation as a model of adult language learning. Within that model we have an account of the notion of transfer together with several examples of language learner production which can be explicated using this account. It is an approach to transfer in which the notion of transfer as a process is replaced by the notion of transfer as a constraint imposed by previous knowledge on a more general process, that of inferencing. Thus it is a simpler model than one in which transfer is viewed as ontologically distinct. We also have an expanded notion of previous knowledge: the basis from which one infers the domain from which the correct hypothesis will be taken to account for new data. This previous knowledge includes L1 knowledge and also the learner's conceptualization of the target language.

Presumably, the search for tests of the model will leave us with sufficient work to do in the future so that we won't be disturbed if, somewhere along the way, we discover that the process of transfer has disappeared.



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