Second-Language Learning: Evidence from a Polyglot Savant·

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1 Introduction

In an earlier paper (Smith & Tsimpli, 1991) we gave a preliminary report on a young *"savant"* who, despite being institutionalised because he is unable to look after himself, has a remarkable talent for acquiring and using foreign languages. In that article we built on work by O'Connor & Hermelin (1991) to establish that the man (Christopher) has some competence in about sixteen languages; that the integration of his pragmatic (inferential) and linguistic abilities in English is within normal limits; and that his prowess in the acquisition of second and subsequent languages is amenable to description in terms of current linguistic theory. We concluded our previous paper by drawing attention to the problem of developing a theory of second language acquisition in terms of which we can describe and ultimately explain Christopher's remarkable language learning abilities, and it is to this issue that we turn in the present article. We have considered two basic hypotheses. The first is that Christopher is an exceptional case in that, for him the process of L2 learning is identical to L1 acquisition in the sense that he learns a "first" language each time he is presented with input data from a new language. In other words, there is a repeated process of parameter-setting taking place which excludes any influence from already constructed grammars. The second hypothesis assumes that Christopher's language learning abilities are similar to those of any other adult second language learner in which case the syntactic properties of the languages he acquires, other than English, could be accounted for by a general theory of L2 acquisition. Christopher's "exceptional" performance in translation as well as in the speed of his language learning would then have to be considered as issues to be dealt with independently of a purely linguistic account. What could be a possible explanation for these facts remains for the moment open.

In order to adjudicate between the two hypotheses we first had to establish the nature and extent of Christopher's knowledge of his native language in comparison with the knowledge attributed to any L1 speaker. We devised a number of tests, mainly grammaticality judgement tasks, involving a wide range

of syntactic constructions in English: wh-movement, passivization, parasitic gaps, middles, dislocation, topicalisation etc. The results from these tests indicate clearly that Christopher's L1 grammar is comparable to that of any other native speaker of English. In turn, this implies that the process of acquisition standardly assumed to be at work in all first language learning can account for Christopher's attainment of English as well.

For the other languages that he speaks, we presented Christopher with a number of tasks, concentrating on particular dimensions along which these languages differ from English. For the purposes of the present paper we will concentrate on the results obtained from constructions involving properties standardly associated with the pro-drop parameter, namely null subjects, *that*-t effects and inverted subjects. Apart from English, the languages tested were Modern Greek, Spanish and Italian. Below, we present a sample of the relevant tests, whose results we will compare with those obtained from adult second language learners tested on the same syntactic phenomena. The aim of this comparison is to motivate the choice of one of our initial hypotheses over the other. It should be noted that a parameter-resetting model, which treats a wide range of phenomena as the reflexes of a single parametric choice, predicts that there should be a clearcut difference in the acceptability of sentences involving these phenomena in Modern Greek, Spanish and Italian on the one hand as opposed to their English counterparts on the other.

2 The data

Example sentences were presented to Christopher in type-written form. He reacted to them both orally (all the proceedings were tape-recorded) and by annotating the stimulus material in writing. In our presentation of the results here the stimulus sentence is preceded by an asterisk if it is ungrammatical in the language concerned, although no such indication was given to Christopher. This is followed by an indication of Christopher's judgement, so that "C: * (1)", for instance, means that Christopher marked the stimulus with a cross and/or said that it was "bad". This in turn is succeeded by his attempted correction or corrections, where again an asterisk indicates that his "corrected" version was in fact ungrammatical, or unacceptable on the intended reading. Consider (1) and (2):

(1)   * Who did you say that arrived yesterday?

           C: * (1)
           C 's correction: delete "that"

(2)   * Which student do you think that could solve the problem?

C: * (2)
C 's correction: 1. change "that" into "who"
                 2. delete "who"

(2')   Pu ine o fititis nomizis tha eline to provlima?
           where is the student think-you could solve the problem
           "Where is the student that you think could solve the problem?"

Christopher considered both sentences ungrammatical and suggested corrections that amount to the exploitation of the same strategy: the deletion of the complementizer. In (2) he first changed "that" into "who" and then deleted the wh-pronoun as well. His initial correction was possibly due to his mistaken interpretation of the sentence which he originally thought involved a relative clause. This is evident from the translation of (2) into Greek that he provided and which is given in (2'). The Greek version shows a sentence which includes both a relative and a complement clause. When he gave this translation he was corrected both by being presented with the correct translation of (2) into Greek and by our repeating the English sentence in the original version. He then deleted the relative pronoun too. Consider next (3) and (4):

(3)   Pjos ipes oti efige?
           who said-you that left
           "Who did you say left?"

C: * (3)
C: Pjos ipe oti efige?
   who said-he that left
   "Who said that he left?"

(4)   Pjos ipan oti itan enohos?
           who said-they that was guilty
           "Who did they say was guilty?"

C: * (4)
C: Pjos ipe oti itan enohos?
   who said-he that was guilty
   "Who said that he was guilty?"

According to Christopher's judgements, (3) and (4) are ungrammatical - contrary to fact - thus leading us to the conclusion that, as far as Christopher is concerned, these examples involve violations of the *that*-t filter. The facts

become more interesting when we look at the strategy Christopher adopted to correct these examples. This involves changing the person agreement on the matrix verb into the third person singular, thus rendering the wh-word the subject of the matrix clause, and resulting in a radically different interpretation. The implication of this correction of Christopher's is that he allows no movement across an overt complementizer, with the result that the sentence is not an instance of a *that*-t violation. Notice, moreover, that complementizers in Greek are not allowed to delete, a fact of which Christopher seems to be aware, as can be deduced both from the corrections above and from his judgements on Greek sentences which lack a complementizer introducing the embedded clause. In view of this, the strategy he adopted for the Greek examples (3) and (4) should be different from the complementizer deletion strategy he adopted for English.

Let us now turn to congeneric examples from Spanish and Italian.

(5)   Quien dijeron que se fue?
        who said-they that left
        "Who did they say left?"

        C: * (5)
        C: 1. Is it "dijo" ?
           2. Quienes dijeron que se fueron?
              who-pl said-they that left-they
              "Who said that they left?"

(6)   Quien penso Marcela que bailo solo?
        who thought Marcela that danced alone
        "Who did Marcela think danced alone?"

        C: * (6)
        C: 1. Penso Marcela que bailo solo?
              thought Marcela that danced alone
           2. Marcela penso que quien bailo solo?
              Marcela thought that who danced alone?

These Spanish examples are also judged to be ungrammatical by Christopher. As his corrections show, he first attempted to change the agreement marking on the matrix verb in (5). We repeated the verb as in the example, at which point he decided to change the number on the wh-word. The result is the same, namely the wh-word becomes the subject of the matrix verb and the sentence does not involve extraction of the subject from the embedded clause. It is noteworthy that, as with other examples, he also changed the agreement on the embedded verb. In several cases where there was both a matrix and an

embedded clause (either interrogative or declarative) Christopher changed the person agreement of the embedded verb so that it was possible to consider the two subjects coreferential. The suspicion then is that he treats null subjects in embedded clauses as obligatorily controlled by the matrix subject. We have no conclusive evidence for this and further investigation of this issue is left for future research.

Christopher first corrected (6) by deleting the wh-word altogether, so that the wh-question was converted into a yes-no question. It should be mentioned that Christopher allows sentences to be verb-initial only if they are taken to be *yes-no* questions. That is, if this word-order is correctly accounted for by the operation of I to C movement, then this process has been generalised by Christopher. Moreover, when he was asked where he would put the wh-word, he placed it after the complementizer, i.e. *in-situ*. A pattern he adopted for the majority of wh-questions involving *that*-t sequences in both Spanish and Italian, as we can see in examples (7) and (8):

(7)   Chi ha pensato il comitato che fosse il candidato migliore?
        who thought the committee that was the candidate best
        "Who did the committee think was the best candidate?"

        C: * (7)
        C: 1. Delete "chi"
            2. Ha pensato il comitato che chi fosse il candidato migliore?
            3. Ha pensato il comitato chi fosse il candidato migliore?
               thought the committee that was the best candidate

(8)   Chi ha pensato Carlo che fosse stata sola quella notte?
        who thought Carlo that was alone that night
        "Who did Carlo think had been alone that night?"

        C: * (22)
        C: 1. Delete "chi"
            2. Ha pensato Carlo che chi fosse stata sola quella notte?
               thought Carlo that who was alone that night

In the Italian data, exemplified by (7) and (8) the results are similar to those in Spanish and Greek. The sentences are considered ungrammatical and the strategy used to correct them involves first making the wh-question a *yes-no* question and secondly, placing the wh-word *in-situ*, giving rise to structures which are ungrammatical unless pronounced with the appropriate echo intonational pattern. From the data discussed so far, it seems clear that Christopher treats pro-drop languages no differently from English with respect to *that*-t effects. In contrast, he accepts and uses null subjects in all these

languages both in his spontaneous speech and in test sentences. That is, he adopts the null subject property of the pro-drop parameter correctly in the appropriate set of languages, even though he fails to show appropriate mastery of *that*-t effects.

The next property associated with the pro-drop parameter that we will discuss is the possibility of subject inversion in Greek, Spanish and Italian. Needless to say, Christopher does not allow postverbal subjects in English. We begin with Greek examples in (9) and (10):

(9)   Idha oti efige o Yanis.
         saw-I that left-3s the-nom Yanis
         "I saw that Yanis left."

         C: * (9)
         C: Idha oti o Yanis efige.
            saw that the Yanis left

(10)   Tilefonise i Anna.
         telephoned-3s the-nom Anna
         "Anna called."

         C: * (10)
         C: 1. Is it "tin" (the-acc) (Anna)
            2. I Anna tilefonise.
               the-nom Anna called

These sentences exemplify the option available in Greek of having the subject postverbally. Christopher considered both examples ungrammatical; in (9) he moved the subject to preverbal position and in (10) he did the same after confirming that the NP is indeed the subject and not the object. He first asked whether the determiner "i" should be in the accusative (i.e. "tin"), thus marking the following NP as the object and, with the subject of the sentence phonetically null. He then repositioned the subject in preverbal position. We, now, turn to the Spanish examples, (11) and (12):

(11)   Llego Juan.
         Arrived John
         "John arrived."

         C: * (11)
         C: Juan llego.

(12)   Leyo el libro Juan.
          read the book John
          "John read the book."

          C: * (12)
          C: Juan leyo el libro.

These data exhibit VS and VOS word-order respectively. As far as Christopher is concerned both are ungrammatical and he corrected them by repositioning the subject to preverbal position. He has also been tested for his reaction on VSO order in each of Spanish, Greek and Italian. In the first two languages, VSO is an acceptable word-order but it is not in Italian. For Christopher, however, VSO is as unacceptable as VOS in all these languages when the sentence is declarative. He accepts VSO only in interrogatives, as can be seen in his judgement of (13) and (14):

(13)   Ha visto il film Maria.
          saw-3s the film Maria
          "Maria has seen the film."

          C: * (13)
          C: 1. Is it a question?
              2. Maria ha visto il film.

(14)   Sono arrivati tre uomini.
          arrived three men
          "Three men arrived."

          C: * (14)
          C: Tre uomini sono arrivati.

Concluding the discussion of the data relating to the pro-drop parameter, it seems to be the case that, as far as Christopher is concerned, sentences containing null subjects are generated by his grammars of the pro-drop languages we have discussed. Sentences characterised by *that*-t violations and postverbal subjects, however, are not available to him. That is, his grammar of English seems to be minimally different from his grammars of the pro-drop languages, in that only the choice of having a null subject is correctly applied.

    To be in a position to choose one of our initial hypotheses over the other we now need to establish whether second language learners of pro-drop languages in general treat comparable constructions in the same way as Christopher. If data from second language learners pattern with Christopher's, then a single account will hold for the behaviour of all second language

learners, including Christopher and our second hypothesis will be supported. If data from second language learners turn out to be different to Christopher's then we shall need to look elsewhere for an explanation of his ability, perhaps treating him as an individual case of exceptional language learning. In terms of the two hypotheses put forward at the beginning, this would mean abandoning the second one: that Christopher learns a second language like all L2 learners, though it would still leave open a range of possibilities within our first hypothesis.

3 Data from L2 learners

Results from tests similar to those we used with Christopher which were presented to L2 learners indicate that the null subject option is indeed mastered from the very early stages of L2 learning. In Liceras's (1989) study for example, French and English speakers learning Spanish accepted null subjects in sentences involving both referential and non-referential use of pro. The results were not equally native-like, however, when subject-inversion was considered. Postverbal subjects, especially in the early stages of L2 learning, were not accepted in the majority of cases. Moreover, sentences involving apparent violations of the *that*-t filter were also considered ungrammatical, and the strategy adopted to correct them was identical to that used by Christopher in some of his examples namely, changing the number agreement on the matrix verb, thus rendering the wh-word the matrix subject (and not extracted from the subject position of the embedded clause). The examples in 15(a&b) illustrate two different ways of avoiding *that*-t violations both used by the subjects in Liceras's study:

(15)   Quien dices que estudia espanol contigo?
        who say-2s that study-3s spanish with you
        "Who do you say studies Spanish with you?"

        correction: a. Quien dice que estudia espanol contigo?
                          who say-3s that study-3s spanish with you
                          "Who says he studies Spanish with you?"
                       b. Quien estudia espanol contigo?
                          who study-3s spanish with you
                          "Who studies Spanish with you?"

On the basis of these observations we can conclude that the native-like exploitation of null subjects by L2 learners contrasts sharply with their rejection of postverbal subjects and apparent violations of the *that*-t filter. Comparing these results with Christopher's it is clear that they both exhibit the same

patterning with respect to the acceptability of the constructions involving properties of the pro-drop parameter. It is only natural to conclude, therefore, that the second hypothesis we considered in the beginning, namely that Christopher's second language learning can be accounted for by a general theory of L2 acquisition is confirmed. We will now try to present an account of the data discussed so far, in terms of a theory of L2 acquisition applicable not only to Christopher but to L2 learners in general.

4 An alternative theory of L2 acquisition

The assumption for first language acquisition is that subject inversion, apparent violations of the *that*-t filter and null subjects cluster together under a single parameter namely, the pro-drop parameter. The question for second language acquisition raised by the data discussed above is then whether we are dealing with parameter-resetting or with some other process of learning, perhaps not involving parameters at all. If second language learning is a process of parameter-resetting then we need an explanation for the fact that only the null subject property is affected by this parametric change: presumably, the other two properties would need to be treated as transfer errors (see below). On the other hand, if parameter-resetting is not the process responsible for second language acquisition then we are left with the problem of determining the structural representation of null subjects in the L2 grammar of a speaker whose L1 is non-pro-drop.

To make the issue decidable, we need to make explicit which version of the theory of parametric variation we are adopting. Following the work of Ouhalla (forthcoming) and Tsimpli & Ouhalla (1990), we assume that parameters are associated exclusively with functional categories. These form a finite set of abstract categories which collectively constitute a component of UG referred to as the UG lexicon. Each abstract functional category is specified for a finite set of properties given by UG, among them, for example, grammatical features with open values. These values are fixed on the basis of positive evidence and are then encoded in the lexical entries of the corresponding functional morphemes in the lexicon. Further, it is the functional categories, the UG lexicon, rather than the principles of UG, which are assumed to be subject to maturational development. This assumption gives rise to a range of implications that can be tested in the process of L1 acquisition (cf. Tsimpli (in prep.)). If the functional categories (the UG lexicon) constitute the component of UG that is subject to maturation then it will be this component of UG that is subject to effects of the Critical Period. The critical period hypothesis claims that language acquisition is optimal only during a narrow "window" that closes at the latest at puberty. If correct, this would imply that at a certain age the UG lexicon is no longer accessible to the

language learner. That is, second language learners do not have access to the UG lexicon and consequently to the parameters associated with individual functional categories hence second language learning could not involve parameter-resetting.

However, we still wish to claim that the construction of an L2 grammar is regulated by the principles of UG, though these are not associated with parameterisation. The assumption that UG is available throughout all stages of any language acquisition process implies that the grammars constructed are always possible grammars. However, the parametric options adopted in the first language cannot be reset and are imposed on L2 data, giving rise to what are known as transfer errors. The claim that L2 grammars are not constructed on the basis of a parameter-resetting process accounts inter alia for the relative slowness of L2 learning as well as the fact that L2 grammars are typically less than perfect - i.e. non-native-like - compared to the grammar of a first language. Where the grammar of the second language differs from that of the first, it is due to the fact that the second language acquisition process makes use of inductive learning strategies which are not specific to language. The different levels of achievement among L2 learners compared to the uniformity of attainment in first language acquisition can be accounted for in this way. If second language learning was deterministic in the way that first language acquisition is claimed to be, we would expect the mature state of L2 grammars to be similar across the speakers of the language. As is well-known, this is not the case.

We still need to determine the status of null subjects in the L2 grammars of non-pro-drop speakers. If we are correct in excluding the possibility of parameter-resetting in second language learning, null subjects cannot plausibly be taken to be structurally realised as pro, unless we make the ad hoc assumption that there is some other unspecified, non-parametric, means of inducing the existence of pro. Given that the L1 setting requires sentences to have an overt subject, we assume that the agreement marking in null subject languages is treated as a subject clitic in the L2 grammar. The subject position is filled by the agreement element which subsequently cliticizes onto the verb as do subject clitics in standard French. Overt subjects, when they are used, occupy a position other than the canonical subject position, being probably instances of dislocated phrases, occurring in topic position. Direct evidence for this latter claim cannot be easily demonstrated from the L2 grammar of a speaker of a non-pro-drop language, such as English, as an SVO utterance with an overt subject in a pro-drop language will be superficially identical to its English counterpart. However, given the theoretical claim suggested, the reverse situation, where a speaker whose first language is pro-drop learns a non-pro-drop language, the L2 should provide relevant evidence. In other words, if L1 is a null subject language and L2 is a non-null subject language then our claim is that pronominal subjects in L2 will be treated as agreement

elements (not occupying the canonical subject position) while all other subjects will occupy a topic position. Evidence for this claim is discussed in Tsimpli & Roussou (this volume) where Greek speakers learning English are tested on syntactic constructions involving the pro-drop parameter. Typical examples involving both pronominal and dislocated subjects are given in the examples of spontaneous speech in (16):

(16)   (a)   My daughter she got to go to the theatre.
        (b)   This man he's on the telephone.
        (c)   John he's coming.

Although the sentences in (16) are grammatical in English with the non-pronominal subject in a dislocated position and the subject pronoun in the canonical subject position, it is striking that in the English of these Greek speakers, sentences with either only a pronominal or only a non-pronominal subject are not produced. Instead they produce constructions with null subjects, giving rise to clearly ungrammatical English sentences, as in (17):

(17)   (a)   Is dancing. (= He is dancing)
        (b)   Thursday come to school. (= On Thursdays, I come to school)
        (c)   Is raining. (= It's raining)

The fact that only the choice between constructions like (16) or (17) is available in the early stages of English L2 learning suggest that the underlying representation of sentences with overt subjects, like those in (16), is different from the representation standardly associated with similar constructions in native English. Similar transfer errors produced by speakers of a null subject language learning a non-null subject L2 have been attested in the L2 literature. The relevant data come from adult Spanish speakers learning English (White, 1985). The level of acceptability for such speakers of sentences with null subjects, sentences with subject inversion and sentences which involve *that*-t effects was strongly biased by the status of such constructions in the grammar of their first language. In the light of the L2 theory suggested here, and given that the second language has a parametric setting different from that of L1, both sets of L2 data involve transfer errors. Moreover, on the assumption that null subjects in the second language are not really "null" in the way that a [+ pro-drop] parametric option would require, the L2 theory suggested here has no need to resort to the notion of "markedness" (cf. Hyams, 1986 (for L1 acquisition), Liceras, 1989 (for L2 learning), among others) in order to explain the superficial difference between learning a null-subject language and a non-null-subject one.

To conclude, we have tried to test two hypotheses about Christopher's learning abilities: either that he is a talented but "normal" second-language learner or that he is an exceptional case. We have compared his performance on sentences involving properties of the pro-drop parameter with results from other L2 learners tested on similar constructions. On the basis of this comparison we have concluded that Christopher is indeed a "normal" second language learner. We have also suggested a preliminary theory of L2 learning based on the idea that, whereas principles of UG are available in any language acquisition process, parameters are not reset in the process of second language learning, rather the parametric values selected for L1 are transferred intact to L2. In the light of this theoretical assumption we have tried to provide an account of null subjects in the L2 grammar of a non-pro-drop speaker. This account assumes that the agreement element is treated as a subject clitic as is standardly assumed for French: i.e. the representation does not really involve an instance of a null subject at all. In the absence of parameter-resetting in L2 the learning process is then assumed to make use of general learning mechanisms plus principles of UG. There is much we still do not understand about Christopher's abilities. It is clear that he presents a combination of stunning linguistic proficiency with general intellectual disability. It is also clear that his first language ability lies within normal limits, whereas his language learning faculty is quantitatively different from other adult L2 learners. Our results also show, however, that this language learning ability seems to be, in part, independent of the module responsible for L1 acquisition. Clarification of the nature of the principles involved in his language learning and an investigation of the inductive learning strategies he uses remain basic tasks of the investigation. A detailed description of the nature of learning strategies as well as their interaction with the Language module will, ultimately, shed more light on the structure of the human brain and, in particular, the nature of the central processing systems.

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