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CHILDREN'S PASSIVES AND THE THEORY OF GRAMMAR

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1. Introduction

This work studies the acquisition of Greek passives with two core objectives: a) to evaluate the (two) predominant theories that seek to explain the late development of passives in children's grammar, i.e., Borer & Wexler 1987, 1992, Fox & Grodzinsky 1998, and b) to demonstrate how within Wexler's (2004) recast of development of passives in terms of phase theory (Chomsky 2000, 2001), data from children's (interrogative) passives are able to contribute to aspects of movement in novel ways. Therefore, we consider this work as a manifestation of the manner in which syntactic theory contributes to the understanding of (stages of) language development, and an example of how data from early language can be employed to evaluate aspects of syntactic theory (Terzi 2005).

2. On the acquisition of passives

Passives are known to develop extremely late in children's grammar. English speaking children, for instance, demonstrate difficulties with passives until at least around age 5 (Maratsos et al. 1985). What is most difficult for them are passives of non-actional verbs (essentially verbs with experiencer subjects, such as, *see, remember*, etc.), (1), contrary to passives of actional verbs (that is, verbs with agent subjects, such as *push, find*, etc.), (2).

(1) Mary was seen by John.
(2) Mary was pushed by John.

Borer & Wexler's (1987, 1992) *A-Chain Delay Hypothesis* holds that children's problems with passives follow from the assumption that the formation of verbal passives involves an A-chain, which is subject to

maturation. English speaking children do better at passives of actional verbs, (2)-(3), because they perceive them as adjectival, (4), that is, formed in the lexicon (as proposed in Wasow 1977).

(3) The doll was combed (by Mary).
(4) The combed doll.

On the other hand, the *Theta-role Transmission Deficit* account, Fox & Grodzinsky (1998), holds that children do poorly at non-actional passives because they involve the process of the (suppressed) theta-role transmission, in addition to the A-chain. Children perform better at passives of actional verbs, (2)-(3), because the agent theta-role of the verb is assigned directly by the preposition *by*, hence, no theta-role transmission takes place. They perform worse at passives of non-actional verbs, (1), because theta-role transmission adds extra processing load, which is presumably above their computational abilities. Finally, children are predicted to do better at passives of non-actional verbs without a *by*-phrase precisely because no theta-role transmission is involved.

2.1 On Greek passives

Greek presents interest, especially for the A-Chain Delay Hypothesis, since it has two types of passives, morphologically distinct, and arguably formed in different components of grammar. The verbal passive, (5), is a synthetic form in which the verb inflects for non-active (NAct) voice, perfective or imperfective aspect, tense and subject agreement. The adjectival passive, (6), is a periphrastic form consisting of the auxiliary 'be', which inflects for person, number and tense, and a participle which agrees with the subject in Case, gender and number.

(5) To vivlio diavastike apo tus fitites.
the book read-NAct-3s by the students
'The book was read by the students.'
(6) To vivlio ine diavasmeno (apo olus tus fitites).
the book is-3s read-nom-sg-neut (by all the students)
'The book was read by all students.'

Earlier claims concerning Greek passives (Lascaratou & Philippaki-Warburton (1984)) consider (5) to differ from (6) in that the former is built in the syntax, while the latter in the lexicon (cf. Wasow 1977). Such

views concerning verbal vs. adjectival passives were widely held until recently (see Anagnostopoulou 2003 for a detailed review).

3. On the acquisition of Greek passives

With the above in mind, Terzi & Wexler (2002) studied Greek children's passives, testing both actional and non-actional passives, with verbs similar to those in Maratsos et al. (1985). The actional verbs below were tested for verbal and adjectival passives and the non-actional verbs for verbal passives only (since they do not form good adjectival passives in adult grammar). All sentences contained the *by*-phrase, i.e., a prepositional phrase headed by the preposition *apo*.

(7) *Actional verbs*: a. *sproxno* 'push', b. *xtipao* 'beat', c. *akubao* 'touch', d. *kinigao* 'chase', e. *vurtsizo* 'brush', f. *filao* 'kiss'.
(8) *Non-actional verbs*: a. *agapao* 'love', b. *mirizo* 'smell', c. *vlepo* 'see', d. *akuo* 'hear'.

The test was a picture verification task, in which children were presented with two pictures and were asked to identify the one that corresponded to the sentence that was read to them. One of the two pictures depicted the sentence they heard and the other depicted a sentence with the same verb but the theta-roles reversed. The results appear in the Table 1.

Age groups	Verbal passives Actional verbs	Adjectival passives Actional verbs	Verbal passives Non-actional verbs
1. 3;8-3;10 n=5 (M=3;9)	0.03	0.83	0.20
2. 4;2-4;10 n=14 (M=4;7)	0.33	0.77	0.13
3. 5;3-5;10 n=11 (M=5;6)	0.44	0.89	0.20

Table 1: Percentages of correct responses

From the findings of Table 1, Terzi & Wexler (2002) concluded, among other things, that: a) the fine performance of children on (full) adjectival passives supports the view that, when there is no A-chain, the child can analyze the sentence, despite the presence of a *by*-phrase. b) The extremely low performance on the full verbal passive of actional verbs

shows that these passives are analyzed differently, presumably involving an A-chain. Unlike in English, children cannot substitute them with the corresponding adjectival passives in Greek, since the two are not homophonous. c) The lower performance on verbal passives of non-actional verbs, especially after age 4, is somehow more difficult to explain. It may be because these passives are less felicitous in adult grammar as well.

The above findings left some unresolved issues however. Children's much lower performance at verbal passives of non-actional verbs, for instance, makes one wonder whether some process of theta-role transmission (Fox & Grodzinsky 1998) is also at play. In order to fully investigate the relevance of the theta-role transmission process one should investigate children's behavior on both long and short passives, i.e., passives with and without the *by*-phrase.[1]

4. The current study

Although the first part of this study was essentially meant as a follow up of Terzi & Wexler (2002), we introduced a number of changes in methodology (apart from testing both, long and short, passives). Namely: a) we added one more age group, in order to get a better grasp of the age at which passives are acquired. b) We changed two of the verbs: *feed* and *kick* substituted *touch* and *brush* respectively, because they were easier to depict and formed better adjectival passives. c) Instead of pictures we used photos shown on a computer screen, because we thought it would be more fun for children. d) Children had to choose from three rather than two pictures. Table 2, next page, reports the results.

Summarizing the results, we note that: a) we do not observe in the present study the extremely low performance at verbal passives of actional verbs that was found in Terzi & Wexler (2002). Recall that we changed two of the actional verbs of the previous study. Nevertheless, although we recalculated the results, leaving out these two verbs, we did not obtain results that diverged significantly from those of Table2. b) Adjectival passives of actional verbs are consistently better than the corresponding verbal passives in this study as well. Nevertheless, only for the third age group is the difference statistically significant. c) Verbal passives of actional verbs are, again, by far better than verbal passives of non-actional verbs. d) For no age group and for none of the three types of passives did we find significantly different behavior depending on the presence of the *by*-phrase. Moreover, there does not seem to be a tendency with or

without the *by*-phrase either, with the exception of the second age group perhaps, for which short passives were better.

Age groups N=10 (each)	*By*-Phrase	Verbal Act. Verbs	Adjectival Act. verbs	Verbal Non-act. verbs
1. 3;6-4;00 M=3;7	Yes	0.68	0.78	0.45
	No	0.67	0.75	0.35
2. 4;1-4;10 M=4;4	Yes	0.68	0.77	0.35
	No	0.75	0.85	0.47
3. 4;11-5;8 M=5;3	Yes	0.67	0.90	0.45
	No	0.72	0.85	0.52
4. 5;9-6;6 M=6;0	Yes	0.85	0.87	0.55
	No	0.83	0.88	0.47

Table 2: Percentages of correct responses (long and short passives)

We conclude that the similar performance of children at long and short forms of both types of verbal passives indicates that the presence (or not) of the *by*-phrase is not of obvious importance for the acquisition of passives. Hence, the view which attributes late appearance of passives to theta-role transmission difficulties (Fox & Grodzinsky 1998) is not supported by the results of the present study. On the other hand, the different behavior of children with respect to verbal and adjectival passives (of actional verbs) argues in favor of Borer & Wexler (1987, 1992) who associate late appearance of verbal passives with (the late maturation of) A-chains.[2] Nevertheless, the much better performance of children at verbal passives of actional verbs, when compared with the results in Terzi & Wexler (2002), as well as the consequent less pronounced difference between verbal and adjectival passives of this study, requires further thought. An explanation of the better performance of children at verbal passives of actional verbs, as compared to non-actional verbs, in both studies is also pending.

4.1 Theoretical developments: two types of participles

In recent work, Anagnostopoulou (2003) and Alexiadou & Anagnostopoulou (2007) offer a new account of Greek adjectival passives/participles. In the spirit of Kratzer (1994, 2001), they distinguish between two types of adjectival passives in Greek, both being stative, but differing in a number of other ways. *Target state participles*, (9), refer to states that are in principle reversible. They are compatible with result-oriented modification, i.e., *akoma* 'still', and are not associated with agentivity (hence, they do not accept agent-oriented modification, nor *by*-phrases or instruments). *Resultant state participles*, (10), refer to states that hold forever. They are incompatible with result-oriented modification, and are associated with agentivity (hence, they accept agent-oriented modification, *by*-phrases and instruments). Most relevant is the idea that the above two types of Greek participles are more similar to verbal passives than previously thought, as they are both considered to be formed in the syntax.[3]

(9) Ta pedia ine (akoma) krimena (*apo ti Maria).
the children are still hidden by the Mary
(10) To theorima ine (*akomi) apodedigmeno apo ton Galo mathimatiko.
the theorem is still proven by the French mathematician

Here is how the above may relate to our findings: the adjectival passives we studied involve agent external arguments, hence, their compatibility with the *by*-phrase. It is then conceivable that the similar performance of children at verbal and adjectival passives of actional verbs reflects precisely the similarities between these two types of passives. The results of the previous study, however, in addition to children's consistently lower performance at verbal, when compared to adjectival, passives of this study remain unexplained. It is possible that the results of this study (in which adjectival passives were better, but not always significantly better than verbal passives) is a simple side effect of the experimental task: since adjectival passives are stative, a task that uses pictures may precisely favor stative interpretation.[4] With this much said, let us now turn to the other issue that this study aimed to investigate.

5. Current developments in the acquisition of passives

In Wexler (2004), children's difficulties with passives are reexamined in terms of phase theory. He assumes that passive v, i.e., $v_{def,}$ is not a phase

(Chomsky 2000, 2001), hence, the object DP moves as in (11): it does not (or, cannot) stop at Spec, v_{def}, since this is not the edge of a phase. Moreover, there are no relevant features to check or Agree with v_{def}.

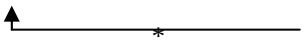
(11) $John_i$ T $[v_{def}$ was pushed $t_i]$ Adults

Wexler (2004) claims that children's problems lie with what they consider to be a v-phase and he proposes the *Universal Phase Requirement* (UPR) in (12), which he takes to hold for children until around age 5:

(12) UPR: v defines a phase, whether v is defective or not.

Children do not accept raising of the object to Spec, T, because they consider v_{def} as v*, or else, to define a phase, (13). However, there are no relevant features for raising of the object to Spec, v_{def} first, hence, the uninterpetable phi-features and the EPP features of T are not deleted and the derivation does not converge for children.

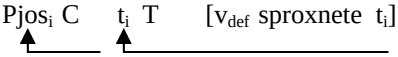
(13) $John_i$ T $[t_i$ v_{def} was pushed $t_i]$ Children



The UPR is thus able to explain children's difficulties with passive and raising constructions (while it is not relevant for raising of the external argument of transitives from Spec,v to Spec, T, which was predicted to be problematic by the A-chain Delay Hypothesis, contrary to fact).

A further issue Wexler (2004) raises, given (12) and (13), is what children do with *wh*-passives. In adult grammar, since passive v is not a phase, the standard assumption is that adults move the *wh*-phrase directly to Spec, T (and then to Spec, C), (14). If, however, children consider v_{def} to be a phase, we have to assume that children's movement in wh-passives, unlike that of adults' in (14), proceeds via (the outer) Spec, v_{def}, just like in v* of adult (active) *wh*-question.

(14) $Pjos_i$ C t_i T $[v_{def}$ sproxnete $t_i]$ Adults



who push-NAct 'Who is pushed?'

As a consequence of children's behavior at *wh*-passives, attributed to UPR, we have the opportunity to test directly whether A' to A movement is licit in grammar. This is so because children presumably allow

movement to Spec, v_{def}, of passives since they consider it to be the edge of a phase. This movement now becomes possible, because the v phase carries interrogative features, and is an instance of A'-movement. We also know that children already perform (ordinary) *wh*-movement at the ages we are studying, which means that they are able to move to Spec, C.[5] Therefore, we expect them to also form good *wh*-passives – provided they consider the intermediate step of the movement, i.e., the movement from Spec, v_{def} to Spec, T to be licit, see (15) later.

In our experiments, along with the passives we reported earlier, we tested *wh*-passives. We only tested short passives, so that the task would not become too long and tiring for children, but included both, verbal and adjectival, passives. Table 3 reports the results.

Age groups N=10 (each)	*By*-Phrase	Verbal Act. verbs	Adject. Act. verbs	Verbal Non-act. Verbs
1. 3;6-4;00 M=3;7	Declar.	0.68	0.78	0.45
	Interr.	0.25	0.35	0.37
2. 4;1-4;10 M=4;4	Declar.	0.68	0.77	0.35
	Interr.	0.53	0.55	0.47
3. 4;11-5;8 M=5;3	Declar.	0.67	0.90	0.45
	Interr.	0.45	0.67	0.32
4. 5;9-6;6 M=6;0	Declar.	0.85	0.87	0.55
	Interr.	0.70	0.67	0.55

Table 3: Correct responses on declarative and interrogative long passives

Table 3 demonstrates that children did worse at interrogative passives in all, but the non-actional passives of the 2nd age group. Even in this case, however, the difference between declarative and interrogative passives was not statistically significant. Thus, we see that although children were at ages they have acquired *wh*-movement, meaning that they are able to perform movement to Spec, C, they did not do well at *wh*-passives.

We are led to conclude that children's low performance at interrogative passives must be related to their difficulties with passives in particular. Assuming that they perceive passive v_{def} to define a phase (hence their problems with declarative passives in the first place), they should allow movement to Spec, v_{def} in *wh*-passives. It follows, therefore, that the specific problem they face is related to the following (intermediate) step of the movement, namely, the movement from Spec, v_{def} to Spec, T, demonstrated in (15) below. Crucially, this is precisely an instance of A' to A movement, hence, the results demonstrate that children seem to be aware of that.[6]

(15) Pjos$_i$ C t_i T [t_i v_{def} sproxnete t_i] Children

who * push-NAct 'Who is pushed?'

6. Summary and Conclusions

This work aimed at improving our understanding of the development of passives, while investigating what the data contribute to syntactic theory, and, in particular, to properties of movement. With respect to the first objective, we concluded that the new evidence from Greek argues that associating late development of passives with late development of A-chains has advantages over a theta-role transmission account. Nevertheless, we note the need to investigate in detail the properties and status of the Greek adjectival passives, as well as the properties of the preposition *apo* that heads the Greek '*by*-phrase'. Subsequently, we demonstrated that, once we assume an approach to children's passives based on phase theory (Wexler 2004), children's passives offer novel empirical evidence for the ban on A'-to-A movement in grammar.

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Notes

[1] We became aware of the fact that testing the presence vs. absence of the *by*-phrase in Greek is relevant only if Greek *apo* is similar to English *by* (in terms of having an agent/affector theta-role to discharge to its DP object). It is very

unlikely that the two Ps are similar in this respect, but the issue requires research that is beyond the current work (see Kallulli 2007 for recent discussion). Nevertheless, it seems to us that, even if *apo* has no such argument properties, the theta-role transmission deficit account still makes predictions that are not borne out by our results: it predicts that all short verbal passives (i.e., not only those of non-actional verbs) should be better than the long ones.

[2] It should be reminded, however, that only for one age group were adjectival passives significantly better than verbal passives in this study.

[3] To be precise, Alexiadou & Anagnostopoulou (2007) are not directly concerned with whether participles are built in syntax. Rather, they tacitly assume so, while their primary concern is the similarities and differences between the two types of participles they identify.

[4] It should also be pointed out that if resultant state participles are closer to verbal passives than previously thought, in the relevant sense, and the ones we studied are resultant state, studying children's performance at target state participles may be able to shed further light to our questions.

[5] See Guasti 1996, 2000 and Hamann 2000 for detailed discussion of wh-movement, which seems to be mastered at age 2.

[6] Note that, as T. Guasti (p.c.) pointed out to us, children's low performance at adjectival *wh*-passives does not follow from a view that considers them not to be formed in syntax. This is a valid point, which renders the need for further investigation of adjectival passives even more imperative. As a speculation, if adjectival passives are formed in syntax, the above question does not arise. Moreover, their less pronounced difference with verbal passives than in the previous study is easier to be attributed to the methodological issues of section 4.1.

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