Doctoral Thesis

Actional Passives in Child Catalan

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Declaration

I hereby declare that this thesis has been written by me, that the work has been

carried out by me, or principally by me in collaboration with others as acknowledged,

and that the thesis has not been submitted in fulfillment of any other degrees.

Francisco Javier Parramon Chocarro

*To my
parents, Enric and
Encarnació,
and my
children, Eric and
Ariadna*

Acknowledgements

Abstract

This thesis results from the first comprehensive investigation into children's acquisition of actional passives in two varieties of Catalan: Central Catalan and Majorcan Catalan. The acquisition of passives by children has proved to be delayed in a number of languages, especially those which do not have s-homophones between an adjectival passive and a verbal passive. Firstly, a study of spontaneous production in children and adults was made to see the frequency of the different kinds of passives (periphrastic, adjectival and pronominal) for both groups. Using a sentence-picture matching task I undertook a first experiment to see if there was delay in the acquisition of actional passives in Catalan. Also, and because the *by*-phrase in Majorcan Catalan has the same preposition as agentive nominals, a second experiment was run to see the possible facilitation of having the same preposition in the comprehension of long passive constructions; no effect of the preposition was found. Lastly, a third experiment was run to check the comprehension of adjectival passives versus short passives; verbal passives were shown to be interpreted as adjectival until the age of 7.

Resum

Aquesta tesi és el resultat de la primera investigació extensa en l'adquisició de les passives agentives en dues varietats de català: el català central i el mallorquí. L'adquisició de passives per part dels nens mostra un retard en diverses llengües, especialment aquelles en què la passiva verbal i l'adjectiva no són homòfones. En primer lloc presento un estudi de dades espontànies tant en adults com en nens per veure la freqüència dels diferents tipus de passives (perifràstica, adjectiva i pronominal) en català. Mitjançant una tasca d'aparellament d'imatges i frases vaig realitzar un primer experiment per esbrinar l'adquisició de passives agentives en català. Com que en català mallorquí s'utilitza la mateixa preposició en les passives llargues i en els nominals agentius vaig fer un segon experiment per veure la possible facilitació en la comprensió de les formes passives llargues en tenir la mateixa preposició. La preposició però, no va tenir cap efecte en els resultats. Finalment, un tercer experiment compara la comprensió de les passives adjectives i les passives curtes. Els resultats indiquen que fins als 7 anys els nens fan una interpretació adjectiva de les passives verbals.

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Chapter 1. Introduction

The purpose of this thesis is to find out about the comprehension of actional passives in Catalan and to check the validity of different hypothesis that have been put forward for the delay attested in many languages, among which we can find, English (Maratsos *et al*. 1985, Borer and Wexler 1987), Mandarin Chinese (Chang 1986), Spanish (Pierce 1992), Dutch (Verrips 1996), Japanese (Sugisaki 1999), Brazilian Portuguese (Gabriel 2001), Greek (Terzi and Wexler 2002), Russian (Babyonyshev and Brun,2003), German (Bartke 2004) and Serbian (Djurkovic 2005, Perovic *et al*. 2014). In order to do this a comprehensive study of spontaneous data production has been made along with several experiments, designed specifically to ascertain at what age the comprehension of actional passives in Catalan is finally attained. The study has been enlarged with an experiment for Majorcan Catalan because of the specific features of this variety that allow for the testing of a particular hypothesis on the *by-*phrase, and an experiment on adjectival passives to see the children's performance on this construction as opposed to short passive sentences given the assumption in the literature that children assign an adjectival reading of the latter.

In what follows, in chapter 2 of this thesis, I take a thorough look at the different hypothesis that have been proposed to account for the difficulties in comprehension, and the corresponding delay in acquisition on the children's part with respect to passive sentence constructions. In chapter 3 I exemplify the different constructions of the passive found in Catalan (periphrastic, adjectival and pronominal) and point out the different goals of this thesis. In chapter 4 I make a complete study of the spontaneous production of children based on the CHILDES database so as to know to what extent children use the passive construction or hear it from the adults that interact with them. In chapter 5 I report an experiment on the comprehension of

actional passives in Catalan of children aged 3-6. In the experiment children were tested on their comprehension on actives, short passives and long passives. Several conclusions are drawn. In chapter 6 I report a second experiment on Majorcan Catalan to check whether the *by*-phrase facilitates the comprehension of long passives since in Majorcan Catalan the preposition that introduces the agent in passives is the same as the one used in agentive nominals. Conclusions are also drawn out of the experiment. In chapter 7 I report a third experiment on Catalan short passives and adjectival passives in order to see how well children fare when exposed to these constructions. Since it has been argued that children give an adjectival interpretation of English passives due to both constructions being s-homophonous, and in spite of the fact that this s-homophony does not hold in Catalan, I nevertheless wanted to find out whether children made use of this strategy. In chapter 8 general conclusions for the three experiments are reviewed and future research is proposed.

Chapter 2. Background

2.1.   Passivization

Passivization results from an operation of syntactic movement, which was crucial in developing Chomsky's transformational generative grammar and motivated the concept of transformation. The passive shares meaning with its active voice counterpart, but the structural object of the active verb appears in canonical subject position in the passive. In the classical generative analysis of the verbal passive, the object moves to subject position to get nominative case through either a lexical operation (Bresnan 1982) or A-movement (Jaeggli 1986; Roberts 1987) while the subject of the active sentence is demoted to a *by*-phrase or deleted. Case assignment is different in the passive and the active voice: structural accusative case, normally assigned to the object in an active sentence, is missing in the passive, and the promoted object receives nominative case instead. For example, the active sentence *John built the house* gives rise to the passive *The house was built by Tom.*

UTAH (Uniformity of Theta Assignment Hypothesis) states that identical thematic relationships should result from identical thematic role assignment (Baker 1988). Since in actives and passives the same DPs receive the same thematic roles, it is assumed that they derive from the same structure. In the passive derivation, the internal argument appears in the syntactic subject position, forming an argument chain (A-chain) with the trace occupying the object position.

The early principles and parameters treatment of the passive is based around these two principles (see Chomsky 1981; Baker 1988; Jaeggli 1986; Roberts 1987; Baker, Johnson and Roberts 1989):

(1) a. The passive suffix –*en* absorbs accusative Case.

b. The passive suffix –*en* absorbs the external θ-role.

In (2),

(2) The house was built by Tom.

the passive suffix –*en* absorbs the accusative Case assigned by *build* and the external (agent) θ-role. Because the DP [DP the house] needs to receive Case, it raises to Spec, IP (a nominative Case position). Since the passive suffix has absorbed the external θ-role of the verb, the external argument does not need to rise to Spec, IP to get case, therefore leaving Spec, IP available for the direct object to move into.

Burzio's Generalization states that a verb that does not assign an external theta role to its subject does not assign structural accusative Case to its object (Burzio 1981). Given Case Theory and the Case Filter (Chomsky and Lasnik 1977, 1993), and since the verbal passive cannot assign Case, the direct argument undergoes DP movement to subject position to receive Case (Chomsky 1981, Rizzi 1986, Levin and Rappaport 1986). For long passives, the absorbed theta role of the external argument is transferred from the passive morpheme to the *by*-phrase via a process called "theta transmission" (Jaeggli 1986).

Strong Crossover effects (3a), the availability of subject-controlled infinitival clauses (3b), and subject-oriented modifiers (3c), depictives (3d), binding (3e-f), and purpose clauses (3g) provide strong empirical evidence for the assumption that the external argument is present in verbal passives (Gehrke and Grillo, 2007)

(3) a. *They$_i$ were killed by themselves$_i$.

b. The book was written to collect the money. (from Manzini 1980)

c. The book was written deliberately. (from Roeper 1983)

d. The book was written drunk. (from Baker 1988)

e. Damaging testimony is always given about oneself in secret trials. (from Roberts 1987)

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> f.   Such privileges should be kept to oneself.   (from Baker, Johnson
>
> and Roberts 1989)
>
> g.   The book was written on purpose.

Jaeggli (1986: 590) explains θ-role assignment in the passive as follows. First, the passive suffix absorbs the external θ-role of the verb. Second, the passive suffix assigns the PP headed by the preposition *by* the external theta role. This is known as θ-role transmission. Third, the θ-role assigned to the PP is assigned by the preposition *by* to its DP complement. This is assumed in Baker *et al*'s (1989) analysis.

According to Collins (2005) the main problem with Jaeggli's analysis is that the external argument in the passive is assigned a θ-role, through role absorption and transmission, in a totally different way from how the external argument is assigned a θ-role in the active. This means a clear violation of UTAH: Identical thematic relationships between items are represented by identical structural relationships between those items.

Contrary to the proposals by Jaeggli (1986) and Roberts (1987), Collins (2005) departs from classical movement analyses and makes a proposal where actives and passives have the same underlying structure. He argues that external arguments (*by*-phrases included) are generated in their canonical position. Under his assumptions, the movement of the internal argument over the external argument should raise some relativized minimality effect (Rizzi 1990, 2004, Grillo 2008). According to Collins, the passive morphology does not absorb the external theta role or accusative case. Rather, the external theta role is assigned in Spec, vP in line with UTAH and accusative case is checked by the *by*-phrase in Voice^o directly above vP. The *by*-phrase performs no theta transmission; rather *by* is a 'dummy' preposition.

Collins' (2005) analysis is known as a smuggling analysis, where phrasal movement of the passive participle VP containing the object smuggles past the vP containing the subject, thus avoiding a violation of the Minimal Link Condition (MLC; Chomsky, 1995) or relativized minimality. Smuggling of the VP over the vP makes the internal argument the closest to Spec, TP and the object is free to move to subject position. The English verbal passive relies on smuggling followed by raising. The object is raised from a VP that itself has already raised and this combination is possible only in

contexts where the Freezing Principle (Wexler and Culicover 1980, Müller 1998) fails to apply. Smuggling is defined in the following way (4):

(4)   Suppose a constituent YP contains XP. Furthermore, XP is inaccessible to Z because of the presence of W (a barrier, phase boundary, or an intervener for the Minimal Link Condition and/or Relativized Minimality) which blocks a syntactic relation between Z and XP (e.g. movement, Case checking, agreement, binding). If YP moves to a position c-commanding W, we say that YP smuggles XP past W. (Collins 2005).

Given these theoretical approaches we now turn to types of passives and the usage of passive sentences.

2.2.   Types of passives, and usage of passive sentences

Passives without *by*-phrases are referred to in the literature as short or truncated passives (5), whereas passives with the *by*-phrase are referred to in the literature as long, full or non-truncated (6).

(5)   The boy was hit.
(6)   The boy was hit by his brother.

Regarding predicate type, passives of verbs that take the role of agent and patient are known as actional passives (7). On the other hand, passives of verbs that take experiencer and theme roles are known as non-actional passives (8).

(7)   Claire was washed (by her mother).
(8)   Claire was loved (by her mother).

Another distinction amongst passives relates to differences in aspectual meaning, namely the dynamic/stative distinction. Verbal passives are interpreted as dynamic (9) while adjectival passives are interpreted as stative (10). English has the

same surface form for the two kinds of passive. (10) is ambiguous, it could describe merely the state of the window, or that an external agent caused the event.

(9)   The window was broken by vandals.

(10)   My bedroom window was broken.

In other languages, there is a difference in auxiliary choice between dynamic/eventive verbal and stative/adjectival passives. In German, for example, the verbal form uses *werden* 'become' (11) and the adjectival from uses *sein* 'to be' (12).

(11)   Das Haus wird verkauft.

         the house becomes sold

         'The house is being sold.'

(12)   Das Haus ist verkauft.

         the house is sold

         'The house is sold.'   (from Keenan and Dryer2007:337)

Dutch, Spanish, Italian, Greek and Catalan also use different auxiliaries to distinguish the different forms. The derivation of adjectival passives is argued to differ from that of verbal passives.

There is some cross-linguistic variation on whether passives of intransitives are allowed. English does not allow passives of unergative or unaccusative verbs (13) and (14):

(13)   *Mary was laughed.

(14)   *The chief was arrived by visitors.

Latin has passives of unergative verbs like *run* (Keenan and Dryer 2007), from *currere* 'to run' we form *curritur* 'it is run' in the sense 'there is running going on, running is being done'. Bantu languages allow passives of unaccusatives like *arrive* and *die*. The following example (15) from Sesotho is taken from Baker (1996: 22).

(15)   Morena o-fihl-ets-o-e ke-baeti.

         Chief SM-arrive-APPL-PASS-FV by visitors

         The visitors have arrived for the chief

         'The chief was arrived by visitors.'

     Pinker *et al. (*1987) and Pinker (1989) note that, for English, not all transitive verbs passivize. The following examples (16-19) are taken from Pinker *et al. (*1987).

(16)   *Many people are escaped by the argument.

(17)   *A deadly poison is contained by this bottle.

(18)   *Many changes will be seen by the coming decade.

(19)   *Gene is resembled by Tom.

     Pinker (1989:136) suggests that all transitive verbs that have agents and patients can passivize. This agent/patient generalization for passives does not hold for verbs like *see*, which is a transitive, but non-actional predicate. However, if a language has passives, at least part of its transitive verbs can passivize.

     Pinker *et al. (*1987) note that English does not passivize stative verbs like *cost*, *weigh*, and possessive *have*. See examples (20-22).

(20)   *210 pounds are weighed by Tiny.

(21)   *Three bicycles are had by John.

(22)   *Twenty dollars are cost by this shirt.

     Kinyarwanda allows passives of these verbs (Kimenyi1980:127-8). See example (23).

(23)   Ibifuungo bibiri bi-fit-w-e n'ishaati.

         buttons two they-have-PASS-FV by shirt

         'Two buttons are had by the shirt.' 'The shirt has two buttons.'

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Furthermore, there seems to be a cross-linguistic restriction on passives of non-actional verbs. Landau (2002) shows that, in French and Italian, object experiencer non-actional verbs can form adjectival passives, not verbal passives. See the following examples (24 a-c) from Italian taken from Belletti and Rizzi (1988).

(24)   a.   Le sue idee mi entusiasmano.

                The his ideas me excite

                'His ideas excite me.'

        b.   *Sono entusiasmato dale sue idee.   (verbal)

                Am excited by the his ideas

                'I am excited by his ideas.'

        c.   Sono entusiasta dale sue idee.   (adjectival)

                Am excited by the his ideas

                'I am excited by his ideas.'

Landau contrasts French, Italian, and Hebrew with English, Dutch, and Finnish, where verbal passives of object experiencer non-actional predicates are allowed. The following examples (25 a-b) are from Finnish (Pylkkänen 2000).

(25)   a.   Pidän sinu-sta.

                Like.1sg you.ELA

                'I like you.'

        b.   Sinu-sta pidetään.

                you.ELA like.PASS

                'You are liked.'

Most ditransitive verbs can passivize. In some languages, both the direct and indirect object can become the subject of the passive. These languages are called languages with symmetric passives. In Kinyarwanda, Norwegian and Swedish either object can passivize. The following examples (26 a-c) are from Kinyarwanda (Kimenyi 1980).

(26)   a.   Umugabo y-a-haa-ye umugóre igitabo.

                man he-pst-give-asp woman book

                'The man gave the woman the book.'

        b.   Igitabo cy-a-haa-w-e umugóre n'ûmugabo.

                book it-pst-give-pass-asp woman by man

                'The book was given to the woman by the man.'

        c.   Umugóre y-a-haa-w-e igitabo n'ûmugabo.

                woman she-pst-give-pass-asp book by man

                'The woman was given the book by the man.'

In other languages, like English, Fula and Chichewa, only the direct object (benefactive) can become the subject of a passive. These are called asymmetric languages. The following examples (27-28 a-b) are from English (Woolford 1993).

(27)   I sent Pat a letter.

(28)   a.   Pat was sent a letter.

        b.   *A letter was sent Pat.

For some English speakers, theme subjects in passives are acceptable. In English symmetric passivization is usually restricted to the verb *give* (29 a-b)

(29)   a.   She was given a book.

        b.   A book was given her.

There are also cross-linguistic differences as to whether a language allows a long passive, or a phrase expressing the external argument.

Finally, passivization is only possible in some discourse contexts. Sentences like *Tom built the house* and *The house was built by Tom* are both perfectly grammatical sentences in English, and both truthfully describe the very same scene. If a child or an adult understands a full passive that means that the passive is an alternative, optional way to express an agent-object relation.

In adults, the differences in usage of these sentence types are relatively subtle: in (30) the passive is typically used when one wants to de-emphasize, hide the identity of the agent or force the agent into the background (Keenan and Dryer 2007), in (31) the passive can be used to place focus on the patient of the action, and in (32) the passive can be used to retain the topic of conversation in subject position across multiple clauses (see Celce-Murcia and Larsen-Freeman 1999); in (33) the speaker wishes to express a sense of adversity or distress. These examples have been taken from Deen (2011).

(30)   The painting was stolen.

(31)   My brother was hit.

(32)   The singer arrived at the airport and was welcomed by thousands of fans.

(33)   The child was abused and neglected.

Carroll (1958) suggests that the speaker selects the most salient element in a given situation as the subject of the sentence. If the actor in a given situation is the most salient element, the sentence will tend to be in the active voice; and conversely, if the acted-upon element is the most salient, the sentence will tend to be in the passive voice.

These discourse constraints on passive seem to be available to children. Pinker *et al. (*1987) designed an experiment and got the result of children producing passives when asked "What's happening" about the patient (i.e. focusing on the patient). Children need to learn how their language expresses discourse features like patient focus, an emphasis on the patient of the action. For example, in (34) the focus is on the actor, so the sentence is in the active voice, whereas in (35) the focus is on the patient, therefore the sentence is in the passive.

(34)   What did John do to the vase?

    a.   #The vase was broken.

    b.   John broke the vase.

(35)   What happened to the vase?

   a.   The vase was broken.

   b.   #John broke the vase.

Turner and Rommetveit (1968) designed a memory experiment using reversible and non-reversible active and passive sentences and the results obtained with the children strongly supported the hypothesis that focus of attention affects the voice in which sentences are recalled. More specifically, when the actor or total picture was presented as retrieval cue active sentences tended to be recalled correctly and passive sentences tended to be transformed into the active voice in recall; when the acted-upon picture was presented, active sentences tended to be turned into the passive voice and passive sentences tended to be recalled correctly.

Slobin (1968) carried out a related experiment where active sentences tended to be recalled as passives when a picture of the object served as a recall prompt, while pictures of actor or of the total situation facilitated recall of passives as actives. Lempert (1984) provided evidence that children will use passives with patients that are more salient, hence focused.

2.3.   Delay in the acquisition of passives

A great deal of evidence suggests that children are delayed in acquiring the passive as compared to the active. Deen (2011) notes that several reasons may be adduced to account for the relative delay in the acquisition of passive, and these include their scarcity in the input, grammatical role reversal, the optionality of the *by*-phrase and the kind of predicate that is being passivized. Children's difficulty with passives is attested for many languages, among which we can find: English (Maratsos *et al*. 1985, Borer and Wexler 1987), Mandarin Chinese (Chang 1986), Spanish (Pierce 1992), Dutch (Verrips 1996), Japanese (Sugisaki 1999), Brazilian Portuguese (Gabriel 2001), Greek (Terzi and Wexler 2002), Russian (Babyonyshev and Brun 2003), German (Bartke 2004) and Serbian (Djurkovic 2005, Perovic *et al*. 2014). Early studies of the passive in English showed that young English-speaking children do not often spontaneously produce passives. Harwood (1959) found no instances of full passives

over 12,000 utterances produced by five-year-old children. Also children spontaneously produce truncated (short) passives earlier and in greater number than full (long) passives. (Hayhurst 1967; Maratsos and Abramovitch 1975; Baldie 1976). Baldie's study (1976) aimed at determining the average ages at which children imitate (I), produce (P) and comprehend (C) passive constructions. The finding that imitation precedes comprehension which in turn precedes production (I>C>P), as reported by Fraser *et al. (*1963) for 12 three-year-olds, is confirmed in this study for children from 3; 0 to 8; 0. Imitation of the passive form is acquired by the mean age of 4; 9 years. Comprehension follows with nearly perfect performance being achieved at the age range of 6; 6-7; 6. Production is the last skill to be acquired. Corpus studies and comprehension and production studies such as Horgan (1978) have shown that short passives are understood and produced earlier than long passives.

Maratsos *et al. (*1979) found children were much less likely to comprehend passives of non-actional verbs than actional verbs. This is known as the Maratsos effect. In a pair of studies in which they investigated the effect of verb type on comprehension of passive sentences, they compared four-and five-year-olds' comprehension of sentences with verbs which were either actional (e.g. *hold)* or non-actional (e.g*. see*). Although the children performed equally well on active sentences involving both types of verbs, they did much better on passive sentences with actional verbs. Sudhalter and Braine (1985) confirmed Maratsos *et al.*'s results with children aged 3; 0 to 4; 0.

In one of Maratsos *et al.*'s (1985) experiments 16 different verbs were used; 4 actional verbs: *find, hold, wash* and *shake*; 8 non-actional verbs: *remember, forget, know, like, miss, see, hear*, and *watch* (although *watch* seems to be an actional verb); and 4 nonsense verbs: *mell, zick, bemode* and *catter*. Each verb was given in the active and in the passive voice. Thirty-one 4- and 5-year-olds answered the question 'Who did it?' by holding up the finger puppet that represented the doer of the action or, likewise, by pressing a lever in a spring-up box that had a picture of the character on the lid. The actional-non-actional differences appear only in passives and not in actives. The results are shown in Table 1.

Actional verbs		Non-actional verbs		Nonsense verbs	
Actives	Passives	Actives	Passives	Actives	Passives
.91	.67	.89	.40	.88	.47

Table 1. Percentage of correct answers, Maratsos *et al*. (1985).

On the other hand, a minority of studies find fully adult-like performance, even on passives of non-actional verbs, in three-year-olds (Crain, Thornton and Murasugi 1987, 2009; Pinker, Lebeaux and Frost 1987; O'Brien, Grolla and Lillo-Martin 2006). The methodology used in Crain, Thornton and Murasugi first experiment can be illustrated in the following example (36):

(36)   Exp: See, the Incredible Hulk is hitting one of the soldiers. Look over here. Darth Vader goes over and hits the soldier. So Darth Vader is also hitting one of the soldiers. You ask Keiko which one.

Child: Which soldier is getting hit by Dart Vader? (Crain *et al*. 2009: 126)

In the context of this elicitation task the *by*-phrase was needed and children as young as 3; 4 responded accordingly.

In the O'Brien, Grolla and Lillo-Martin (2006) experiment there was at least another possible alternative agent introduced so that children saw the sense of using a *by*-phrase to distinguish the possible alternative agents in the passive sentence (and felicity conditions were satisfied). This is illustrated in the following example (37), taken from O'Brien *et al.* (2006: 447).

(37)   Exp: Oscar is very grouchy. He doesn't like anybody. I wonder if someone likes him, though? Here's a Fancy Lady and a parrot. I wonder if the Fancy Lady likes Oscar?

Fancy Lady: Ew! Oscar stinks. I don't like him because he lives in a garbage can.

Exp: Well, I wonder if the parrot likes him?

Parrot: Oh, yes, I like you Oscar. I don't mind that he lives in a garbage can. I like you, Oscar.

Exp: Gobu, can you tell me something about that story?

Gobu: Well, let's see. Oscar was liked by the parrot.

As we show later, the introduction of these pragmatically elaborate methods does not guarantee adult comprehension of passives on the part of children.

2.4.   Early accounts

Regarding the problem that passive syntax is difficult to acquire, early explanations proposed that passives are derivationally complex (Brown and Hanlon 1970) or non-canonical (Bever 1970) and this means that it takes children some time before they learn them. Children acquire the canonical word order in their language quite early, especially in languages that have relatively fixed orders, such as English. In languages like English, from very early on children assign the agent thematic role to the phrase that precedes the verb (the subject), and the theme/patient role to the noun phrase that follows the verb (the object). In the literature there is a great deal of naturalistic evidence for this (Brown 1973) as well as experimental evidence (Hirsh-Pasek *et al.* 1984, Hirsh-Pasek and Golinkoff 1999). On the other hand, there is also evidence that children know non-canonical orders. In other languages where there are derived orders such as in Turkish, children also acquire this relatively variable order.

According to Bever *et al.* (1973) if a child has (i) acquired canonical word order in English as Subject-Verb-Object, and (ii) learned that the subject is typically the agent, then one might expect children to miscomprehend the passive. Furthermore, one might expect that the miscomprehension would occur predictably in one direction: the passive should be misunderstood as its active counterpart, but not vice versa. However, other accounts do not contemplate the canonical order as an explanation for the delay in the acquisition of the passive. There is evidence the acquisition of other constructions with non-canonical order such as object extracted wh-questions, are not affected by low input. For example, Hirsch and Hartman (2006) conducted an experiment crossing questions type (canonical subject extracted vs. non-canonical object-extracted *who*-questions) and verb type (actional vs. non-actional, or: psychological).Children performed extremely well on all four conditions. Across all subjects, all four conditions were answered at better than 92% accuracy. This would

demonstrate that non-canonicity itself is not responsible for poor performance. If non-canonical word order alone was responsible for children's difficulties with passives, we should see a parallel deficit with object-extracted questions.

2.5. Frequency

The passive is quite frequent in written English; however, it is significantly less frequent than active sentences in the input that children are exposed to. Gordon and Chafetz (1990) quantify the frequency of passive utterances in English child-directed speech. In an analysis of 86,655 lines of child-directed speech in the Adam, Eve and Sarah corpora from the CHILDES database, they found that 36/10,000 utterances, or 0.0036%, of parent utterances were passive (313/86,655). They describe the adult data in terms of passive length, predicate type and aspectual meaning. Adults predominately use short passives; only 4 of the passives were long/full passives (1%). In terms of predicate type, the majority of adult passives were formed with actional verbs. As Gordon and Chafetz note, passives of non-actional verbs were a "non-occurring event" (Gordon and Chafetz 1990: 236). Gordon and Chafetz also classified adult passives as either being verbal or adjectival, and found that 63% (197/313) of the adult passives were adjectival.

It has been argued in the literature that Inuktitut and Sesotho are examples of languages where children seem to have no difficulty producing passives as early as 2;0. Demuth (1989) notes that the timing of the acquisition of various structures including the verbal passive is influenced by language-specific factors. In Sesotho, for example, there is early acquisition of the passive since passive occurrence is higher than in English in both the adult language and adult input to children, and this is so because Sesotho subjects are topic oriented (Demuth 1990).

In Sesotho, a high percentage of passives is found in the input (Demuth 1989). In her study data was compiled over a two-year period of research in rural Sesotho and consisted in 84 hours of spontaneous children interactions with adults, peers and older siblings. The data were pooled into six 2-4 months intervals to show whether there was a gradual and steady increase in the use of verbal passives over time or if they appeared suddenly. The results are shown in Tables 2 and 3. Table 2 shows the

number and proportion of passives sentences uttered and Table 3 gives a breakdown of the types of passives produced at each interval.

Interval	1	2	3	4	5	6	Adults
Age	2;1-2;3	2;4-2;6	2;7-2;9	2;10-3;2	3;9-3;10	4;0-4;1	
N of utterances	1704	2925	3307	3159	1520	1603	386
N/Proportion of passives	6/.4	11/.4	33/1.0	27/.9	32/2.1	30/1.9	23/6.0

Table 2. Total number and proportion of Sesotho passives.

Interval	1	2	3	4	5	6	Adults
Age	2;1-2;3	2;4-2;6	2;7-2;9	2;10-3;2	3;9-3;10	4;0-4;1	
N of passives	6	11	33	27	32	30	23
Full	2/33.3	5/45.5	8/24.2	7/25.9	5/15.6	4/13.3	13/56.5
Short	4/66.7	6/54.5	14/42.4	17/63.0	17/53.1	17/56.7	7/30.4
Impersonal	0	0	11/33.3	3/11.1	10/31.3	9/30.0	3/13.0

Table 3. Types of passives (n/proportion of total passives).

My conclusion is that Sesotho children hear from adults a lot more utterances in the passive than their English counterparts and also use the passive more extensively than English children. Kline and Demuth (2010) argue that Sesotho speaking children have acquired the passive via "implicit learning" (Gupta and Dell 1999, Tomasello and Abbott Smith 2002). Acquisition is through repeated exposure and experience, where repetition or priming create long-term changes in the language production system (Bock and Griffin 2000, Chang, Dell, Bock and Griffin 2000, Ferreira and Bock 2006). In non-generative accounts, passive acquisition is directly linked to serial order, input and memory, and not to innate mechanisms. A certain number of verbs of a certain type must be learnt on an individual basis before a child can use the construction effectively. When the input is low, the children do not have enough exposure for their learning (Tomasello 2000a, 2000b, Tomasello and Abbot Smith 2002, Tomasello and Akhtar 2003).

According to Allen and Crago (1993), Inuit caregivers use passives at least 2.8 times more frequently than English-speaking adult caregivers. Numbers for full passive use are far higher in the Inuktitut input than in English. Data taken from naturalistic

communication situations between 3 Inuktitut children and several friends and family members show that for the Inuktitut children before age 3; 1 the production in 23.7 hours of tape was of 93 passives whereas in English (Adam, Eve, Sarah and Allison) 12 of the passives occur in the 113 hours recorded on tape before age 3; 1 (Pinker *et al.* 1987). This higher frequency of passive use in the input in Inuktitut then co-occurs with higher frequency and earlier acquisition of passive in Inuit children. Also certain characteristics of the Inuktitut language structure including among others the fact that passive utterances are simpler that active ones because the passivized verb has to agree only with the grammatical subject, whereas the active transitive verb has to agree with both the subject and object can play their part in an account for early passive acquisition in Inuktitut.

As we can see the number of passives, especially long passives, and the percentage of passives per utterance in Sesotho and Inuktitut are higher than those found in other languages.

The verb-based account presupposes that the passive is acquired and represented on individual verbs within the lexicon. Maratsos *et al. (*1979) argued that children initially acquire many rules on an item-by-item basis. However, in explaining the actionality effects in passive comprehension Maratsos *et al. (*1985) specifically rejected the possibility of a verb-based account. Very few researchers have actually proposed a verb-based account of the Maratsos effect, since the effect seems to be clearly semantically motivated, and so it is natural to look for a semantic (class-based) explanation.

2.6.   Theoretical Accounts

2.6.1. The A-Chain Delay Hypothesis (ACDH)

Two main theories try to capture the acquisition of passive: (i) the grammar-based account (Borer and Wexler 1987, 1992), Wexler (2004), Hyams and Snyder (2005)) where it is claimed that young children's non-adult behavior arises from the difference between their grammar and that of adults irrespective of the input and (ii) the input-based account (Maratsos *et al.* (1985), Pinker *et al. (*1987)). They claim that

there is a direct connection between the input children receive and grammatical performance and competence.

Two different sources were at the origin of the A-Chain Delay Hypothesis (ACDH) (Borer and Wexler 1987). Firstly, Horgan (1978) found that English children did not produce long verbal passives spontaneously. Horgan ran an experiment, an elicited production task, and she noticed that children were producing passives with a stative interpretation. The truncated passives of younger children were almost exclusively an after-the-fact observation on the state of things. According to Horgan, the category stative may be broader for children than for adults and if passives are really stative (and thus adjectives) to children, then truncated sentences are not passives at all. She makes reference to Farwell (1976), who also claims that an action and its resultant state are undifferentiated for the young child. To these works we can add Israel *et al.* *(*2000), who argue for the extension of stative participles to eventive uses. They claim that: '…after producing their first stative participles, but before producing any unambiguous eventive ones, children regularly begin to use participles in equivocal contexts, where they can be interpreted either as stative or eventive". Their data, based on an exhaustive analysis of seven longitudinal corpora, reveal a consistent pattern in children's spontaneous productions of passive participles. Early uses of participles, starting with children's earliest word combinations, are consistently adjectival and stative, as in examples (38a-c). Only much later are participles used to denote the actual events which can cause such states, as in (39a-c).

(38) a. car broken. (Adam 2;4)

   b.   pumpkin stuck. (Nina 2; 1)

   c. now it's fixed. (Peter 2; 0)

(39) a. you don't like to be rolled into clay. (Adam 3;11)

   b. she likes to be hugged. (Nina 2; 11)

   c. this was broken and I gotta fix it. (Peter 2; 9)

The other source was Hebrew. In spontaneous production studies of Hebrew, researchers found adjectival passive forms, but not verbal passive forms, which they

do not produce until 10 years of age (Berman and Sagi 1981, Berman 1985). In Hebrew the adjectival passive is not homophonous with the verbal passives, unlike in English, and children are delayed on all verbal passives.

Borer and Wexler (1987) relied heavily on these results to argue against the Continuity Hypothesis (Pinker 1984), according to which the principles of Universal Grammar are in place from the earliest stages of acquisition. Instead, Borer and Wexler proposed that at least some principles undergo a process of maturation and may not be operative until quite late. In the case of passives, they suggest that young children can derive adjectival participles in the lexicon, but that until the age of five years they lack the principles required for DP-movement and so cannot derive true verbal passives.

(40)   A-Chains Delay Hypothesis (ACDH)(Borer and Wexler 1987)
         'Children under the age of 5 do not have the grammar to form A-chains.'

According to the maturation hypothesis, particular linguistic structures which do not occur at an early stage suddenly fall into place once the relevant linguistic principles mature within the child, and neither learning nor triggering needs to be invoked in the explanation of ordering of acquisition. The key example supporting this hypothesis is the apparently late maturation of the principle governing A-chain formation implicated in the DP-movement used in passives. In (41) an A-chain is represented by coindexing of the trace and *John*.

(41) $John_i$ is pushed t_i.

According to Borer and Wexler's (1987) A-chain Delay Hypothesis (ACDH), children are unable to build the argument chain created by the movement of the object argument to the subject position. Young children thus have difficulties interpreting passives of both actional and psychological verbs, but the relatively good performance on the actional passive is due to a strategy of interpreting this passive not as verbal but as adjectival. As mentioned earlier, verbal and adjectival passive forms

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are homophonous in a number of languages, including English; therefore, the same form of the participle (e.g., *broken*) is used for the verbal passive (42).

(42)   The toy was broken by Mary.

and the adjectival passive (43).

(43)   The toy looks broken.

However, the two forms are derived by different mechanisms. Verbal passives are traditionally derived by movement. In contrast, the derivation of adjectival passives does not involve movement: the syntactic representation of the adjectival passive is the same as that of any adjective: *the happy man, an interesting man.* Adjectival passives are acquired early (Horgan 1978), and cross-linguistic evidence confirms that in languages where adjectival passives are not homophonous with verbal passives, children demonstrate an early mastery of adjectival passives, but a delayed knowledge of verbal passives (e.g., Hebrew: Berman and Sagi 1981; Greek: Terzi and Wexler 2002), exactly as predicted by the ACDH and as I detail below. Because psychological verbs rarely make good adjectival passives, children cannot rely on the adjectival strategy with these verbs.

Borer and Wexler take participles of actional verbs to be semantically compatible with adjectival passives, while participles of non-actional verbs are not. While acknowledging that there are exceptions, they consider that there is a marked contrast between the acceptability of non-actional (44a-b) and actional (45a-b) participles in adjectival contexts (sentences from Borer and Wexler 1987: 135).

(44)   a.   *the doll appears seen; *the seen doll; *seen though the movie
                  was,   John decided to go again.
         b.   *the doll appears liked; *the liked doll; *liked though the doll
                  was, John did not keep it.

(45) a. the doll appears combed; the combed doll; combed though the doll was, Janie recombed her.

  b. the doll appears torn; the torn doll; torn though the doll was, John decided to keep her.

However, many actional verbs make questionable adjectival passives. See example (46).

(46) ?The ball is hit.

And some non-actional verbs make fine adjectival passives. See example (47).

(47) The ball remains unseen. (from Hirsch 2011:27)

The compatibility of actional predicates with adjectival passives provides English-acquiring children with a possible alternative structure for actional verbal passives, but not for non-actional verbal passives. When a child encounters a passive with an actional verb, the adjectival passive serves as what Babyonyshev *et al.* (2001) call a s(yntactic)-homophone for the verbal passive, a sequence with distinct grammatical structure, but common pronunciation. As subject experiencer verbal passives do not have corresponding adjectival passives, children are left without any grammatical parse for this type of passives. Comprehension of non-actional passives, which have no s-homophone, is predicted to occur only once A-chains become available to children, permitting an adult-like analysis for all verbal passives.

Further evidence for Borer and Wexler hypothesis came from Greek and Russian. In a language in which adjectival and verbal passives do not share a common pronunciation, the adjectival passive cannot serve as an s-homophone for the verbal passive, and therefore children speaking such a language should be equally delayed in their comprehension of actional passives and non-actional (or: psychological) passives.

Terzi and Wexler (2002) were able to investigate young Greek children's comprehension of adjectival passives and verbal passives with both actional and experiencer verbs in Greek (for further details see section 7.3.). Adjectival passives and verbal passives are not s-homophonous. They found adjectival passives to be

comprehended extremely well, even at age three. As expected, subject experiencer passives were found to be delayed, even for five-year-olds. Unlike in English, however, actional verbal passives in Greek were quite poorly comprehended (only 44% correct for the five-year-olds group).These poor results show that Greek children do not use the adjectival strategy to interpret a full verbal passive.

Further evidence supporting the use of the adjectival strategy in the interpretation of verbal passives comes from Babyonyshev and Brun's (2004) study on the acquisition of Russian. Babyonyshev and Brun examined both adult-produced and child-produced Russian noting whether the passives were perfective or imperfective. Examining the 212 unambiguously verbal passives produced by children, 193 (91%) were perfective. This overwhelming preference for perfective passives is neither present in adult's use, where there is a slight bias for imperfective passives, with perfective passives used only 44.2% of the time, nor in children's use of actives, where no significant difference between the use of perfective and imperfective aspect was discovered. Russian adjectival passives are homophonous with truncated perfective passives. Thus, in Russian the children produce perfective passives which are s-homophonous with adjectival passives. This may be taken as evidence that children analyze verbal passives as adjectival passives in Russian. (See again section 7.2. for further details).

Further support for the s-homophone account comes from Serbian. Perovic *et al.* (2014) ran an experiment with Serbian actional and non-actional or psychological passives. Ninety-nine monolingual Serbian-speaking children, aged between 3; 6 and 7; 6 years took part in the experiment. A two-choice picture-selection task was designed to test knowledge of active and passive structures, based on Maratsos *et al.* (1985) and Hirsch and Wexler (2006c). The actional verbs used were *kiss*, *carry* and *push* and the non-actional/psychological verbs were *watch*, *love* and *dream about*, which in Serbian requires no preposition. The results show a performance at ceiling for actives of both actional and non-actional/psychological actives. For actional verbs both short and long passives were very well understood by children of all age groups. It must be noted here that Serbian adjectival passives are homophonous with verbal passives so children were able to make use of an adjectival strategy to interpret actional passives, a strategy which is not available with non-actional/psychological verbs; this resulted in

the poorer performance with psychological verbs. Psychological long passive sentences were understood at a rate of 58% at 4;03, 70% correct at 5; 6 and 82% correct at the oldest age tested, 7; 0. Psychological short passives obtained very similar results to psychological long passives.

The prediction of the ACDH is that children will systematically interpret active sentences correctly, but systematically interpret passive sentences as their unergative counterparts, ignoring the passive morphology and the *by*-phrase. Another prediction made by ACDH is that when children begin to comprehend the passive they also begin to comprehend raising sentences and unaccusative sentences, i.e. structures which involve A-chains. The ACDH predicts that verbal passive should be universally delayed. In many European languages this is so, but problems seem to emerge in the acquisition of other non-European languages.

2.6.2.   Challenges to the ACDH

2.6.2.1.   Subjects and adjectival passives

When Borer and Wexler (1987) formulated the ACDH, subjects were not assumed to be generated within the VP, but to be base-generated in Spec, IP. Koopman and Sportiche (1991) argue that subjects are base generated within VP and then are moved to Spec, IP. This movement is an instance of A-movement. It involves the formation of an A-chain between the moved argument and the coindexed trace in VP. Note that ACDH also faces a problem on more recent accounts that dissociate the external argument from the VP, such that the subject is base generated in Spec, *v*P which is lower than VP (Kratzer, 1996). In this case, the subject also moves from one *A*-position to another *A*-position, thus forming an *A*-chain, which the ACDH should rule out as ungrammatical. But not all A-movements are delayed since unergative structures are not delayed and in the active voice, in spite of subjects A-moving out of the verbal domain, children have no difficulty placing the subject outside VP. If one accepts this, ACDH incorrectly predicts that active sentences should be delayed.

Furthermore, in recent work in the syntax of adjectival passives and departing from Wasow's (1997) lexical account, modern accounts assume that adjectival passives

are derived syntactically, like verbal passives (Kratzer 2000, Anagnostopoulou 2003, Embick 2004). Kratzer (1994) argues that adjectival participles in constructions like (48) are not always lexical.

(48)   Das Kind war gekämmt.
         The child was combed
         'The child was combed.'

She points out that adverbs are permitted with adjectival passives (see example (49a), while they are disallowed with adjectives (see 49b).

(49)   a.   Das Haar war ziemlich schlampig gekämmt.
                The hair was rather sloppily combed
                'The hair was rather sloppily combed.'
         b.   *Das Haar war ziemlich schlampig fettig.
                The hair was rather sloppily greasy
                'The hair was rather sloppily greasy.'

Kratzer also notes that an implicit agent is obligatory in German verbal passives, unlike adjectival passives. The adjectival passive in e.g. (50a) is compatible with a reflexive action, while the verbal passive in (50b) requires an agent.

(50)   a.   Das Kind war gekämmt.
                The child was combed
                'The child was combed.'
         b.   Das Kind wurde gekämmt.
                The child became combed
                'The child was combed (by someone).'

Embick (2004) makes a distinction between statives (51) and resultatives (52).

(51)   The door is open.

(52)   The door is opened.

He proposes that resultative passives -as opposed to stative passives- have a fientive feature [FIENT], that is, a type of BECOME operator, designating a durative and dynamic action performed by the subject (53a-b).

(53)   a   AspR always takes a complement headed by v[FIENT]

        b   V[FIENT] always takes a stative complement.

This means that according to several authors adjectival passives involve a syntactic derivation, a possibly an A-chain too, and should be unavailable to young children under the ACDH. This difficulty applies only to the interaction of the adjectival strategy and the ACDH. Therefore a grammatical account that rightly rules out verbal passives, but not actives and adjectival passives is needed.

2.6.2.2.   Pierce on Spanish

The acquisition of passives in Spanish was adduced by Pierce (1992) to be problematic for the ACDH. Spanish has two forms of passive (see Mendikoetxea 1999). The periphrastic (54a), with the auxiliary verb *ser* 'to be' and the passive participle and the reflexive (54b), or morphological passive, with the clitic *se* and the finite verb form. The latter is the most common form of passive in colloquial Spanish.

(54)   a.   Este libro fue escrito en México.
              This book was written in México
              'This book was written in México.'

        b.   Este libro se escribió en México.
              This book CL wrote in México.
              'This book was written in México.'

Furthermore, side by side with (54a-b), structures with the subject occurring to the right of the verb are also acceptable (55a-b).

(55)   a.   Fue escrito este libro en México.

                    Was written this book in México

                    'This book was written in México.'

          b.   Se escribió este libro en México.

                    CL wrote this book in México

                    'This book was written in México.'

The Spanish passives in (54a-b) contain a trace in postverbal (object) position that form an A-chain with the DP in sentence-initial position.

Other examples of sentences with the reflexive passive are:

(56)   a.   Se rompieron las ventanas.

                    One broke the windows

                    'The windows were broken.'

          b.   Las ventanas se rompieron.

                    The windows one broke

                    'The windows were broken.'

Pierce (1992) carried out two experiments. In the first experiment 18 children aged between 3; 7 to 5; 9 acquiring Spanish as their first language were tested on their comprehension of full periphrastic passives (containing *by*-phrases) compared to that of actives. The presence of a *by*-phrase in all passive items was thought to override an adjectival interpretation. The passive conditions contained an additional, nested Agreement factor: agreement cue (AC) versus non agreement cue (NAC). Only two of the verbs in the passive (*fue peinado* 'was combed' and *fue lavado* 'was washed') co-ocurred with the DP pair marked by a gender distinction (i.e. *Juan* (masculine) and *Maria* (feminine)). Because passive participles are marked for agreement with the subject in Spanish, the marking on the participle in these cases (e.g., *lavado* vs. *lavada*) serves as a cue to the subject of the passive sentences. It was thought that the presence of an agreement cue on the participle might have a facilitating effect on performance. The results show that passives with an agreement cue (AC) in V-S order

elicited poorer performance at all ages tested than passives in S-V order. Subjects performed best on those passives containing both explicit agreement and the subject in preverbal position.

The results were analyzed by age groups (six children per group of 4, 5 and 6 year-olds). They are reported in Table 4.

	_____Active_____		_____S-V_____		_____V-S_____	
				Passive		
	S-V	V-S	AC	NAC	AC	NAC
Group 1	66.7	58.4	66.7	50.0	41.7	66.7
Group 2	79.2	58.4	83.4	33.4	41.7	50.0
Group 3	91.7	54.2	83.4	66.7	75.0	66.7
Total	79.2	57.0	77.8	50.0	52.8	61.0

Note: AC =agreement cue; NAC = no agreement cue

Table 4. Percentage of correct answers, Pierce's experiment 1.

In the theory adopted by Pierce the assumption is that passives like (54a), (54b) and (56b) contain A-chains whereas (55a), (55b) and (56a), with postverbal subjects, don't. In (55a-b), the postverbal subject may be assigned nominative case directly (i.e. via government) in postverbal position, without formation of an A-chain (Borer 1986; Jaeggli 1986).

One prediction Pierce made was that, in accordance with the A-chain Maturation Hypothesis, and the claim that postverbal subjects in the periphrastic passive do not form an A-chain with an empty position, the younger children would have more difficulty comprehending the passive in S-V order than the passive in V-S order. Pierce found that children do not find periphrastic passives with postverbal subjects easier to comprehend. In fact, they found them more difficult.

However, according to Burzio (1986) and Belletti (1982), these postverbal subjects form an A-chain. Under this assumption there would be no differentiated patterns of development. The results are also compatible with the hypothesis that A-chains mature at around 5 years of age. (In any event, the sample was too small to be considered evidence for or against the theory of A-chain maturation.)

In the second experiment 45 children aged from 3 to 6 were tested on their knowledge of the morphological passive by means of an elicited production task. Three

age groups were tested: Group 1, of children aged 3 to 4 (13 children), Group 2, of children aged 4 to 5 (17 children), and Group 3, of children aged 5 to 6 (15 children). Pierce's hypothesis was again that structures with a postverbal argument position (57a) should be produced more readily by young children than equivalent sentences in which the DP argument has been preposed (57b).

(57)   a.   Se cerraron las puertas.   VS

One closed the doors

'The doors were closed.'

b.   Las puertas se cerraron.   SV

The doors one closed

'The doors were closed.'

The expectation was in Pierce's view supported: see Table 5. The developmental improvement observed, with half of the 5 to 6-year-old subjects performing well on S-V passives, confirms the assumption that A-chains become accessible during language development only after a period of delay.

	Active				Passive	
	S-V		V-S			
	Intr	*Refl*	*Intr*	*Refl*	*S-V*	*V-S*
Group 1	73.1	65.4	65.4	57.7	34.6	42.3
Group 2	76.5	64.7	85.3	73.5	41.2	69.1
Group 3	70.0	70.0	83.3	83.3	50.0	80.0
Total	73.2	66.7	78.0	71.5	41.9	63.8

Note: Intr = single intransitive; Refl = (active) reflexive

Table 5. Percentage of correct answers, Pierce's experiment 2.

The difference between SV and VS could be interpreted as the result of discourse constraints: postverbal subjects are focused (Solà 1992) and depending on the context of elicitation focused subjects may have been more appropriate. In the case of Pierce's second experiment, the child was presented with a pair of pictures which represented two parallel events involving different characters or objects. The experimenter described one of the pictures using an intransitive, reflexive, or passive

sentence; and instructed the child to describe the other picture in the same way or using the same words. It is quite likely that this context encourages a postverbal subject. An example of a pair in the passive could be (58a-b).

(58)   a.   Las cortinas se colgaron.   SV

             The curtains one hung

             'The curtains were hung.'

        b.   Se colgaron los cuadros.   VS

             One hung the pictures

             'The pictures were hung.'

We do not know if the question that the children were asked in Pierce's experiment 2 was one of the type *¿Qué sucedió con las cortinas/ los cuadros..?*,'What happened with the curtains/ the pictures...?' , which is a narrow Focus question, the preferred answer of which is one with a postverbal subject; or it was one of the type *¿Qué sucedió?*, 'What happened?', which is a broad Focus question, the preferred answer of which is one with preverbal subject.

Pierce assumed that A-chains must be overt, and concluded that ACDH might be inadequate because children were delayed on post-verbal subjects. Her conclusions are based on assumptions that are no longer held.

2.6.2.3.   Raising

Raising verbs are a special class of verbs, exemplified with *seem*. *Seem* does not have a thematic subject and takes a full clause as a complement (59a). There are two ways in which raising verbs get their subjects in English. One involves an expletive subject such as *it* (59b). Alternatively, the raising verb takes the subject from the lower clause, which, without a subject must lose its finiteness in order to be grammatical, as can be seen in (59c); (Deen 2011).

(59) a. [[e] seems [John is happy]].

   b. [It seems [John is happy]].

   c. [John seems [[t] to be happy]].

The subject of the clause, *John*, has moved from the lower subject position to the higher subject position. This movement is into an Argument position and under the ACDH should lead to the same difficulties as the passive. Borer and Wexler (1992) suggest that when faced with a raised subject children will assign a copular analysis to it, so children who lack the ability to form A-chains will interpret (59c) as *John is happy*. So, we have Subject-to Subject raising (StSR) (60), the semantically equivalent unraised counterpart (61) and (62) StSR with an experiencer phrase.

(60) John$_i$ seems [t_i to be dancing].

(61) It seems that John is dancing.

(62) John$_i$ seems to Mary [t_i to be dancing].

Raising verbs do not select a DP argument; they do not provide the subject argument with its thematic role. Furthermore, raising sentences appear to be equal to control sentences that *do* assign a thematic role to their DP argument (see (63) and (64)). In (63), Tommy is the 'wanter', whereas he is not the 'seemer' in (64).

(63) Tommy seems to be going shopping.

(64) Tommy wants to go shopping.

Children do not seem to have problems understanding control sentences like (64) and there is evidence that children comprehend unraised sentences at a much earlier age than either verbal passives or StSR (Hirsch and Wexler 2007; Hirsch, Orfitelli and Wexler 2007, 2008). Using sentence-picture matching and truth-value judgment experiments, Hirsch and Wexler (2004, 2007) and Hirsch, Orfitelli and Wexler (2008) obtained the following results:

a. Unraised sentences are acquired as early as three.

b. Sentences involving StSR raising over an experiencer are delayed until around age seven.

c. Sentences involving StS raising with no experiencer are likewise delayed until around age seven.

d. The delayed acquisition of StSR appears to be linked to the delayed acquisition of verbal passives.

However, Becker (2005) in a Truth Value Judgement Task found that children essentially perform like adults. Becker's (2005) second experiment provides evidence that children interpret the raised sentences not as copular sentences but as true raised verbs. 21 children ages 3- 4 years participated in the experiment. Children had to distinguish *is* (the copular structure) from *seem* (the StSR structure). Four raising verbs (*seem, tend, used, happen*) and four control verbs (*want, hope, try, decide*) were tested. One scenario involved a white dog walking under a purple light, that thus appeared ('seemed to be') purple. Children were then asked to judge the truth of the sentence '*The dog seemed to be purple*'. If children had correctly parsed *seem* as an StSR verb they should respond 'true', since the dog did in fact seem to be purple when standing under the purple light. If, on the other hand, children interpreted the sentence as a copular sentence, they should respond 'false' since the dog's fur was in fact not purple. Similar scenarios were constructed for the subject control condition. Because children provided adult responses for the raising sentences in this experiment Becker concluded that children have no difficulties with (short) StSR. Both age groups perform at statistically significant above-chance level on both conditions. Results are given in Table 6.

Age group	Raising	Control
Three-year-olds	71.4%	64.3%
Four-year-olds	83.3%	78.9%

Table 6. Percentage of correct answers, Becker's (2005) second experiment.

Becker (2006) conducted the same TVJ task, but this time the number of children was bigger (52 children). Results are shown in Table7.

Age group	Raising	Control
Three-year-olds	64.0%	65.9%
Four-year-olds	78.3%	88.4%

Table 7. Percentage of correct answers, Becker's 2006 experiment.

This is not in line with the findings of Hirsch and collaborators just reported, and those of Froud, Tsakali and Wexler (2010). These researchers found that children performed much better given unraised sentences compared to their semantically equivalent raised versions. On raised sentences, children performed at near chance level (45%), whereas on unraised sentences the children performed significantly above chance (80%).

Hirsch, Orfitelli, and Wexler (2008) found the question the children were asked in Becker's experiment confusing. Remember children were asked on the truthfulness of a sentence like '*The dog seemed to be purple*', therefore they ran an experiment with fifty children with 10 children in each one-year interval from age three to age seven and by creating a clear contrast between appearance and reality, they showed that children incorrectly reject a description of what *seems* to be the case if this differs from what is *really* the case. The retained the scenario with the white dog standing under a purple light and included others. Three major changes were made. First, a copular declarative condition was included. Second, an unraised condition was added and finally, the word *really* was added to all conditions as a modifier to the matrix predicate. Children were presented with sentences like *The dog really is white, The dog really likes to be white*, *It really seems that the dog is white* and *The dog really seems to be purple*. It is clear that in the experiment the dog really is white, but seems to be purple. With these alterations children interpreted *The dog really is white* as referring to the permanent state of the dog (i.e. white). With this interpretation, they answered correctly on nearly all items. Children incorrectly rejected the statement that *The dog really seems to be purple* indicating that children in fact understood *seem* as 'to be', that is they were ignoring the raising verb entirely. Children performed well on unraised items. I report their results in Table 8.

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Age	Copula	Control	Unraised	Raised
3	99	100	75	3
4	100	100	70	36
5	100	100	84	34
6	100	99	85	68
7	100	98	80	71

Table 8. Percentage of correct answers, Hirsch *et al.* (2008).

We can see that the vast majority of children younger than six years of age failed to achieve above chance comprehension on the raised condition. Children had much greater difficulty with the raised sentences compared to their unraised counterparts.

Hirsch and Wexler (2007) in order to investigate the relationship between the acquisition of raising and passives administered a passive test to 70 children who had participated in a previous raising study. This experiment tested four conditions, crossing voice (active vs. passive) and verb type (actional vs. psychological). The results show that children performed extremely well on both active conditions. Excellent performance on the psychological actives, which were comprehended slightly better than their actional counterparts, indicates that children have no general problem comprehending psychological verbs. The authors found much worse performance for psychological passives as compared to actional passives. See Table 9.

Group	Actional actives	Psych actives	Actional passives	Psych passives
3 year-olds	96.3%	98.8%	65.6%	38.1%
4 year-olds	95.0%	98.8%	86.3%	50.0%
5 year-olds	97.5%	98.8%	92.5%	58.8%
6 year-olds	97.5%	98.8%	89.4%	45.6%
7 year-olds	97.5%	97.5%	95.6%	75.6%
8 year-olds	100.0%	98.8%	92.5%	82.5%
9 year-olds	100.0%	100.0%	95.0%	90.6%
Total	97.7%	98.8%	88.1%	63.0%

Table 9. Percentage of correct answers, Hirsch and Wexler (2007).

When the children's scores on raising and passives by age group were analyzed the authors could see that they showed a similar developmental behaviour. Before seven years of age, children showed generally no improvement in comprehending either raising or passives, with sudden and dramatic improvement at age seven across both structures. See Table10.

Group	Actives	Control	Unraised	Raised
3 year-olds	100.0%	88.3%	85.6%	43.9%
4 year-olds	99.2%	92.8%	88.9%	45.6%
5 year-olds	99.2%	95.6%	92.8%	44.4%
6 year-olds	99.2%	95.6%	91.7%	51.7%
7 year-olds	100.0%	96.1%	96.7%	71.1%
8 year-olds	99.2%	98.3%	98.9%	75.6%
9 year-olds	100.0%	100.0%	98.9%	92.2%
Total	99.5%	95.2%	93.3%	60.6%

Table 10.　　　Percentage of correct answers, Hirsch and Wexler (2007).

These data strongly suggest that there is a link between the acquisition of raising and the acquisition of passives. Actually, the three-year-old who did well on raising also did well on passives, and likewise, the nine-year-old who failed on raising also failed on passives. There is a near perfect correlation between raising and passives. This provides support for maturational theories. Also the study replicates previous findings that psychological passives are not comprehended until around seven years of age (Maratsos *et al.* 1985; Hirsch and Wexler 2006a).

2.6.2.4.　　　Unaccusatives and the ACDH

Borer and Wexler (1992) hold that if children are unable to form A-chains this has implications for all A-chain derived constructions like, for example, unaccusatives. A sentence like (65a) is analyzed as (65b), where the subject of the sentence is in fact the underlying object. This is in contrast to other kinds of intransitive verbs (unergative verbs) where the overt subject is in fact the underlying subject (66a) and (66b).

(65)　　a.　　The three men arrived.

　　　　b.　　[The three men]$_i$ arrived [t$_i$]

(66)　　a.　　The three men talked.

　　　　b.　　[The three men] talked

　　　　Intransitive verbs only take one DP argument and they are divided (at least) into two main groups: unaccusative verbs like *sink* and *fall* and unergative verbs like *jump* and *laugh.* The main difference is that the thematic role of the argument in accusative verbs is a theme and in unergatives is an agent. In the sentence *The leaf fell*, for example, *the leaf* does not initiate the event, but *the dog* in the sentence *The dog barked* does*. The leaf* receives the role of patient, *the dog* receives the role of agent. In unaccusatives the argument is base generated in object position and moves from object to subject position leaving a trace in object position (67) whereas in unergatives the argument is based-generated in subject position. (68). This hypothesis is called 'The Unaccusativity Hypothesis' (Perlmutter 1978; Perlmutter and Postal 1984).

(67)　　　　The leaf$_i$ fell$_{ti}$
(68)　　　　The dog barked

　　　　Different sources serve as evidence for an unaccusative analysis. One is the presence of resultative phrases, which are restricted to modifying direct objects (69) (Levin and Rappaport Hovav 1995).

(69)　　　　John wiped the slate$_i$ clean$_i$

　　　　Resultative phrases are ungrammatical with subjects of unergatives (70).

(70)　　　　*Mary ran tired.

　　　　However, resultative phrases are licit with unaccusatives. This is perfectly understandable if we assume that the argument of an unaccusative is a direct object. See (71).

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(71)   The river froze solid.

Movement in accusatives can be further seen in *ne*-cliticization in Italian (and Catalan). *Ne* is a clitic that replaces partitive complements of nouns. *Ne* can associate with a direct object in a transitive sentence (72), it is ungrammatical with an ergative verb (73) but it is grammatical with an unaccusative (74).

(72)   Giovanni ne ha insultati due.

           John of-them has insulted two

           'John has insulted two of them.'

(73)   *Ne telefonano molti.

           of-them telephone many

           'Many of them telephoned.'

(74)   Ne arrivano molti.

           of-them arrive many

           'Many of them arrived.'

As we can see, the unaccusative argument is base generated in object position and licenses the clitic *ne.* Both verbal passives and unaccusatives involve A-chains. Thus verbal passives and unaccusatives share a lot syntactically.

According to Borer and Wexler (1992) children analyze unaccusative verbs as unergative verbs, avoiding the necessity for A-movement. Because of the difficulty to differentiate between an unaccusative and an unergative no clear evidence exists on this issue in English.

In Hebrew, both SV and VS word orders are used with unaccusatives. See (75) and (76) taken from Friedmann(2007).

(75)   Nishpax ha-kafe.

           spilled   the-coffee

(76)   Ha-kafe nishpax.

        the-coffee spilled

In the standard analysis, the movement of the DP *the coffee* from object to subject position constructs sentences like (76) from the base-generated order of sentence (75). The moved DP is linked to its initial position via an A-chain. The verb assigns the thematic role of patient to the position where the DP is generated, i.e. after the verb, and the role is transmitted. If Hebrew-speaking children are unable to produce A-chains, or if A-movement is difficult for them and they opt for a structure without movement, then they have the possibility to construct a grammatical sentence in VS order. This optionality allows for the testing of the maturation of A-chains: if children do not master A-chains, they are expected to produce unaccusatives in their base-generated order VS, and refrain from SV order. If they assign unaccusatives an unergative structure, they are expected to produce unaccusatives and unergatives in the same word order, SV only. Friedmann (2007) reports that seven experiments were conducted in order to assess the production of unaccusatives and unergatives in 136 1; 9-4; 0 year-old Hebrew-speakers using tasks of sentence repetition and story retelling. The results indicated that children younger than 4 and even younger than 2 already produce SV sentences with unaccusatives. They distinguish between unaccusatives and unergatives, as they use both VS and SV orders for unaccusatives, but only SV for unergatives.

Sano (2000) and Okabe and Sano (2002) argue against Borer and Wexler's ACDH, because they found that Japanese unaccusatives are acquired before age four. They observed that the subject of an unaccusative sentences is base-generated in the complement position of a verb and it is moved to the subject position via A-movement. Therefore there is an A-chain in Japanese children's unaccusatives before age 4. However, there is a significant delay in the passive, especially the full passive with a *ni*-phrase (the equivalent of the *by*-phrase). But in other constructions such as the benefactive, where the recipient can be marked with other particles including *ni-*, they found that when the benefactive is marked by *ni-*, there is delay, but when it is marked by the other particles, comprehension gets better. Thus, the apparent delay in Japanese passives may be due to problems with the particle *ni-*.

Snyder, Hyams and Crisma (1995) investigated auxiliary selection in Italian-speaking children, and found that children select *essere* ('be') for unaccusatives and *avere* ('have') for unergative and transitive verbs, which provides evidence against the idea that unaccusative verbs are analyzed as unergative verbs. The authors take appropriate auxiliary selection with reflexive and non-reflexive clitics as evidence that young children comprehend unaccusatives. Hyams and Snyder (2005), building on Snyder, Hyams and Crisma (1995),provide evidence that two-year-olds acquiring French or Italian already have an adult-like syntax for the reflexive-clitic construction, which has been argued (e.g., by Sportiche 2008) to require an unaccusative analysis. Along the same lines, Lorusso, Caprin and Guasti (2005) show that children acquiring Italian accurately select auxiliary verbs when using unergative and unaccusative verbs, and in their spontaneous speech, unaccusatives and unergative verbs show different distributions with respect to overt subjects. Guasti (2002) examined a young Italian child's choice of auxiliaries with unaccusatives. The child's age was between 2; 0 and 2; 7. If children analyze unaccusatives as unergatives, one might expect all child productions with unaccusatives and an auxiliary to be of the (unergative) *have* type. The child produced 22 relevant sentences with an auxiliary and unaccusative verb and 19 of them correctly had *be*. Guasti takes this as evidence of early unaccusative acquisition and concludes against the ACDH maturational account.

On the other hand, empirical evidence for the ACDH came from children's acquisition of the genitive of negation construction in Russian (Babyonyshev *et al.* 2001). In Russian the difference between unaccusatives and unergatives can be observed with morphological case. In this construction negated arguments of unaccusative verbs undergo covert A-movement. Unmoved negative DPs get accusative case, while moved negative DPs get genitive case. In a study evaluating children's knowledge of this construction, Babyonyshev *et al.* (2001) show that children respond to A-moved negated arguments as if they were unmoved, and assign them accusative case. That is, children appear to treat unaccusatives much like unergatives, analyzing the underlying object as subject and as they mature they reanalyze unaccusatives as taking an object argument, and when they do this they begin to assign genitive case to negated arguments of unaccusatives.

2.6.3. The External Argument Requirement Hypothesis (EARH)

Babyonyshev, Ganger, Pesetsky and Wexler's (2001) External Argument Requirement Hypothesis (EARH) (77) states the following:

(77)   EARH: Young children consider structures with defective *v* to be ungrammatical. (Babyonyshev *et al*. 2001: 6).

The EARH is an alternative proposal that attempts to account for delays in verbal passive acquisition but, unlike the ACDH, allows VP-internal subjects to raise since these structures do have an external argument. According to the EARH children until 5 or more have difficulties with structures that don't assign a subject/external argument. The EARH is couched in Minimalism under the hypothesis that young children consider structures with *v*def to be ungrammatical, and *v*def does not assign an external theta-role. In structures lacking an external argument, such as verbal passives, StSR (Subject to Subject Raising), unaccusatives and atmospheric verbs the *v* head is 'defective' (Chomsky 1995). Assuming that children's grammars do not permit defective *v*, the EARH distinguishes between verbal passives and StSR-which have a defective *v* and so are ruled out by the EARH, and active transitive sentences and StOR (Subject to Object Raising), which take an external argument and consequently are not predicted to be delayed in children.

The EARH relies on Wasow's (1977) analysis of adjectival passives where participles introduce an external argument and are therefore not problematic for children. In this respect both the EARH and the ACDH conceive the same adjectival strategy to explain the actional/non-actional distinction in English.

At the time the EARH was formulated the field had not come to a firm conclusion about unraised sentences being delayed or not. However, the EARH wrongly predicts that unraised sentences will be ungrammatical for children because, like their StSR counterparts, they lack an external argument, and instead they take an expletive subject.

Neither the ACDH nor the EARH can be maintained, as they make incorrect predictions about children's linguistic knowledge.

2.6.4. Theta transmission. Fox and Grodzinsky's hypothesis

In their 1998 paper, Fox and Grodzinsky, in an attempt to replace Borer and Wexler's (1987) hypothesis, formulated the Theta Transmission Hypothesis which stated that:

(78)   Children's difficulty with passive constructions is related to properties of the *by*-phrase. Specifically, we argue that children are in full control of all aspects of the passive construction except for the ability to transmit the external theta-role of the predicate to the *by*-phrase. (Fox and Grodzinsky 1998: 311).

Sudhalter and Braine (1985) found evidence that acquisition of passives is not all-or-none for particular subclasses of verbs. They used this to favour an alternative "cue-based" approach. The preposition *by* in the passive construction was said to cue the child to expect an agent argument. Because the object of the *by*-phrase in non-actional passives is not an agent, the competition between cues would create a higher probability for error with non-action verbs.

While the preposition *by* in passives is semantically vacuous, the thematic-role of the complement of the *by*-phrase is determined by the verb, not the preposition, as was first noted by Jaeggli (1986).

(79)   Sophocles was kicked by *Euripides*.   (Agent)

(80)   The package was sent by *Sophocles*.   (Source)

(81)   The letter was received by *Euripides*.   (Goal)

(82)   Sophocles is feared by *all students.*   (Experiencer)

Elsewhere in the grammar *by* is semantically contentful. English has a temporal-*by* (83a) and a locative-*by* (83b). Furthermore, English has an agent/affectator-*by*, as seen in simple nominals (83c), and derived nominals (83d), where the *by*-phrases are only allowed in those nominals derived from actional verbs.

(83)   a.   We arrived *by 5 PM.*

        b.   Mary ate *by her locker.*

        c.   the book *by Stendhal*

        d.   the city's destruction *by the foreign army*

Fox and Grodzinsky argue that English-speaking children know that English has a preposition *by* that assigns an agent-like theta role independent of theta transmission. When interpreting full passives, children will analyze the preposition *by* as being the semantically contentful agent-*by* that appears in nominals with *by*-phrases. This agent-*by* will thus be (coincidentally) compatible with full actional passives, but is incompatible with full psychological passives, where the *by*-phrase should receive an experiencer theta-role from the verb, but instead receives an agent theta role directly from the preposition. It is this clash of thematic roles that creates problems with full psychological passives. Children fail in interpreting passives only when the process of theta-transmission is mandatory – only in passives with *by*-phrases that do not introduce affectors.

Fox and Grodzinsky (1998) argument against Borer and Wexler's hypothesis is based on the result of an experiment. They found that children have problems with non-actional passives only when the *by*-phrase is present. In the experiment they conducted they meant to demonstrate that the problem children have with passives disappears once the *by*-phrases are eliminated. The experiment had two components. The first component tested the validity of the results of Borer and Wexler, namely, that although children have no problem in interpreting actional non-truncated *be*- or *get*-passives (84), (85) and certainly do well on actives –both actional (86) and non-actional (87) they have difficulty with non-actional *be*-passives (88). (Borer and Wexler claim that *ge*t-passives are similar to adjectival passives and lack an A-chain.)

(84)   The rock star is being chased by the koala bear.

(85)   The boy is getting touched by the magician.

(86)   The mouse is touching the little girl.

(87)   The pizza baker sees the buffalo.

(88)   The boy is seen by the horse.

The second part directly tested the hypothesis that children have a problem with the *by*-phrase. The *by*-phrases were eliminated from the non-actional *be*-passives to see whether the problem disappeared (89). Two actional verbs were used, *touch* and *chase*, and two non-actional verbs, *hea*r and *see*. Actional verbs each appeared in a full (non-truncated) *be*-passive, a full *get*-passive, and an active control. Non-actional verbs appeared in full passives, truncated passives (89), and active controls.

(89)   The bear is seen.

Each sentence type was paired either with a story in which the sentence was true or with one in which it was false (match (M) and mismatch (MM), respectively), for a total of 24 sentence/story pairs. The MM sentence/story pairs described the reversal of the main event enacted. For example, when the main event in the story was one in which John was chased by Bill, the MM sentence was *Bill is chased by John*.

Thirteen children from 3; 6 to 5; 5 years participated in the experiment. One experimenter manipulated the toys for the staged events and narrated the accompanying story; a second experimenter took the role of a puppet, who uttered the M (match) or MM (mismatch) sentence that either correctly or incorrectly described the staged event. The child judged whether or not the puppet's utterance correctly described the event. If the answer was 'yes', the child 'rewarded' the puppet; if the answer was 'no', the child 'punished' the puppet. That is, children answered correctly when they rewarded matches and punished mismatches. If the child 'punished' the puppet (i.e., said that the puppet was wrong), then he or she was asked, 'What really happened?' This enabled the experimenters to ensure that the child was rejecting the sentence for relevant reasons.

The results showed that children performed at 100% on actives and actional passives. With the non-actional non-truncated passive the performance was at chance (46.1%) and the non-actional truncated passive performance was well above chance (86.5%). These results argue against the ACDH, because they indicate that the children's problem lies not with passives but with the *by*-phrase.

Because it combined data from children who were at different stages of linguistic development, the authors made a more fine-grained analysis and divided the children into three groups.

- Group 1: 2 children, ages 4; 1 and 4; 9. They showed adult performance in all sentences.
- Group 2: 8 children, whose ages ranged from 3; 6 to 5; 5 (mean 4; 75). They performed perfectly on actional *be*-and *get*-passives, non-actional actives and non-actional truncated passives. However, as Fox and Grodzinsky's hypothesis predicts, they performed poorly on the non-actional non-truncated passives (40.6%).
- Group 3: 3 children, ages 4; 3, 4; 6, and 4; 9. They performed just like the children in group 2 but they also had difficulty with the non-actional truncated be-passives (41.6%), a performance which cannot be attributed to the by-phrase.

If we focus on group 2, the largest one, consisting of 8 children, there is a clear-cut argument that their problem with the passives is actually related to the interpretation of the *by*-phrase.

See the following table for the results:

Condition 1: Non-actional be-passives (non-truncated)

	REWARD	PUNISH
MATCH	5	11
MISMATCH	8	8
		40.6% correct

Condition 2: Non-actional be-passives (truncated)

	REWARD	PUNISH
MATCH	16	0
MISMATCH	0	16
		100% correct

Table 11.   Group 2, total answers per condition (8 children X 2 sentences per condition).

2.6.4.1. Hirsch and Wexler contra Fox and Grodzinsky

Hirsch and Wexler (2006b) sought evidence for Fox and Grodzinsky's *by*-phrase hypothesis using natural speech, both in child-produced and child-directed utterances. They searched the input to and output of 1051 English-speaking children in the CHILDES corpus for all sentences containing the preposition *by*. The result was that there were no examples of agent-*by* in either child-produced or child-directed speech. Thus, there is no evidence from corpus research to suggest children know *by* may assign an agent theta-role independent of theta-transmission.

In an experiment conducted by Hirsch and Wexler (2006b) 30 children, with ten children in every one-year interval from three to five years (age range: 3; 0 - 5; 10), were tested on their comprehension of nominal *by*-phrases and nominal *about*-phrases (the latter are abundant in the corpus). The authors designed scenarios that pitted knowledge of *by*-phrases against that of *about*-phrases. Each scenario involved two characters, one who told a story about the other character. A third character was asked to comment on one of the stories, the child then reported whether the character was right or wrong. In half of the stories, the character commented on the story *by* one character (*by*-trials), and the other half *about* one of the characters (*about*-trials). Half of the responses were true, and half of the responses were false.

The results indicated that, until at least five years of age, children do not understand that *by*-phrases in nominals reflect agents/creators, rather they take such *by*-phrases to designate the subject matter of the noun to which they are adjoined, i.e. to interpret them as *about*-phrases. The results are reported in Table12.

Condition	3 year-olds	4 year-olds	5 year-olds	Total
About-T	94.4%	90.0%	95.5%	92.8%
About-F	92.6%	88.1%	90.0%	89.9%
About	93.5%	89.1%	92.5%	91.4%
By-T	34.4%	35.0%	35.0%	34.8%
By-F	18.3%	31.7%	21.7%	23.9%
By	26.6%	33.3%	28.3%	29.4%

Table 12.   Percentage of correct answers in the true and false by- and about-trials.

These results clearly show that children cannot be using knowledge gained from nominal *by*-phrases to determine the semantic properties of semantically contentful *by*. Hirsch and Wexler conclude that the only semantically contentful *by* (other than locative-*by* and temporal-*by*) children know is that of theme-*by*.

In other experiments Gordon and Chafetz (1990), Hirsch and Wexler (2006a), Hirsch and Wexler (2006c) have shown that truncated psychological passives are comprehended at chance level, and even for actional passives there is no comprehension advantage for the truncated form over the full form. So the results of Fox and Grodzinsky have not been replicated.

2.6.5. Universal Phase Requirement

The Universal Phase Requirement (UPR) (Wexler 2004) is rooted in the Minimalist Framework (Chomsky 1995, 2001) like the EARH. In contrast to the ACDH, the UPR (90) does not establish that A-movement itself is impossible for children. The constructions that are problematic are only those that require movement across a defective phase in the adult language, such as passives, unaccusatives, and StSR. For passives, this predicts children cannot form passives because they have difficulty moving a DP out of the complement of *v*.

(90)   Universal Phase Requirement (UPR) states that (any) *v* defines a phase, whether *v* is defective or not.(Wexler 2004: 164).

Wexler proposed this new version of the ACDH relying on the concept of "phases" in minimalist syntax. In the Minimalist Program, derivations are treated in terms of phases. Phase domains are what Chomsky calls "theta complete", and identified as vP and CP. Chomsky (2001) argues that *v* only heads a phase when it has full argument structure and projects a subject, citing transitive verbs or verbs with experiencer subject *v*Ps as examples. If the verb does not have full argument structure the phase is considered defective or weak. According to Chomsky, passive *v* is not theta complete because it does not have an external argument. A tree is built up from

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bottom to top in phases and once a phase has been built, you can't "see into it" any further than the edge. See (91):

(91)   Phase Impenetrability Condition (Chomsky 2001:14): [Given the structure $[_{zp}$ Z$[_{HP}\alpha$ [H Y P]], with H and Z the head of phases]: the domain of H, the domain of H is not accessible to operations at ZP; only H and its edge are accessible to such operations.

The Phase Impenetrability Condition (PIC) states that when working at a phase, only the edge (the head and spec(s)) of the next lower phase are available for analysis, and nothing lower than the edge. In particular the complement isn't available.

In the Universal Phase Requirement (UPR) Wexler (2004) proposes that children's difficulties with the passive are due to their knowledge of the phase properties of *v*, where *v* defines a phase, whether *v* is defective or not. For passives this predicts children cannot form passives because they have difficulty moving a DP out of the complement of *v*. *v** is a full V, that is, one that selects an external argument in its spec and defines a phase. Movement is allowed with v*, and children are not delayed in wh-movement and raising of the external argument (Spec,v) to T (Wexler 2004).Subjects of *v*P can move to [Spec, TP] because the subject, although inside a phase *v*P, can be probed at the next phase, CP, because the subject is at the edge (specifier position) of *v*.

Passives, on the other hand, create a special problem for the theory, as the object of V must move up to T in the higher phase. As already mentioned, Chomsky proposed that the *v* of passives is "defective," that is, it does not assign an external argument and it does not operate as a phase. The *v* of transitives (including unergatives) is denoted *v**; it is this *v* that both selects an external argument in its specifier position, and defines a phase. The child has *v** but does not have v_{def}, rather the child has a type that Wexler names $v*_{def.}$ For premature children, the *v* in passives (i.e. *v*def) is phasal (hence "*"), but does not assign an external argument (hence "def"). As such, verbal passives, unaccusatives and StSR are ungrammatical for the

premature child because the object cannot move past the strong phase boundary v^*_{def}.

On the other hand, the "VP-internal subject" of a transitive (i.e. one with an external argument) clause generated in [Spec, vP] is at the edge of VP At the next higher phase, C, the subject is available for analysis according to the PIC. Thus T can "see" the subject, meaning that Agree and Move can take place. The child subject to the UPR is also unhindered since there is no non-phasal v involved. UPR predicts that the child can raise the subject from the edge of vP with no problem (Hirsch and Wexler 2007).Therefore, the UPR no longer predicts problems with the VP internal subjects, unlike the ACDH. According to the UPR, children have difficulties with constructions which require non-local A-movement, where it is necessary to cross a phase boundary without stopping at the edge.

As for unaccusatives, the UPR expects delay. Because they involve movement from the complement of the vP, unaccusative v must be defective (weak) in adult grammar. However, this v will be phasal for premature children at the UPR stage, and therefore, movement to subject position will be blocked by the PIC. The data available about the acquisition of unaccusatives is mixed; there are studies that show delay and others that show early acquisition as we have shown previously.

The UPR also predicts that there is no problem with the reflexive clitic construction for children. Children's analysis is identical to the adults' because there is always a v^*, and no defective v.

As for Spanish post-verbal subjects Wexler (2004) assumes that they too have A-chains, but they are covert. So the delay is explained even in the simplest form of the ACDH. The UPR predicts delay in passives with covert movement.

Hirsch and Wexler (2006c) propose that children's early passive have the structure of Embick's (2004) resultative adjectival passives. Hirsch and Wexler note that in Embick's resultative adjectival passive structure, the DP that must rise to subject position is originally merged at the edge of vP, so it is accessible to the next phase regardless of the defectivity of v. They also argue that the predicate itself has to make a good resultative state. Unlike stative adjectival passives, resultative passives have an event interpretation. Their proposal is similar to that of Grillo (2008) in that the problem does not lie in movement but in predicate type. Resultative adjectival

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passives are generally short passives of actional verbs although some non-actional verbs like *remember* can have a resultative reading and other actional verbs like *hold* cannot the result of the event. The resultative adjectival passive structure is compatible with the UPR and can hence serve as an s-homophone to a pre-mature child.

The UPR is consistent with what is known about the acquisition of raising. The UPR correctly predicts delay for StSR (with and without an experiencer-phrase) in early child grammar, and for a correlation with the acquisition of verbal passives.

2.6.6. Other hypotheses

Hyams, Ntelitheos, and Manorohanta (2006) argue that the problem with verbal passives is that "canonical alignment" is not respected (since there is a theme in subject position), and premature children find them ungrammatical. The Canonical Alignment Hypothesis, CAH (92) states that, in the earliest grammar, any external argument (for instance, typically an agent) must map onto subject position (Spec, IP).

(92)   Canonical Alignment Hypothesis: Children cannot form A-chains that derive a misalignment of thematic and grammatical hierarchies, viz. an external argument (*agent*, *experiencer*), if there is one, maps onto the subject (Spec IP or TP).(Hyams *et al* 2006: 1064)

The CAH claims that children are unable to represent structures that derive a mismatch between a syntactic position and the canonical theta-role associated with that position. Subject position is uniquely reserved for agents, object position for themes. Children therefore proceed as in (93a-b).

(93)   a. Utterance: Neil was kissed by Louise.
         b. Child's interpretation: Neil kissed Louise.

While adult grammar is flexible in what theta-roles are associated with certain landing sites, the CAH hypothesizes that children's grammar is much more restrictive.

Any A-movement which disrupts this ordering, such as verbal passives, will prove problematic for young children. Active sentences, which do respect canonicity, are predicted to pose no problems for young children. As for unraised sentences the external argument of the embedded clause maps onto the subject of the clause, while the expletive subject of the matrix clause receives no thematic role at all, so it cannot derive a mismatch between position and theta-role. Thus, the CAH does not apply. As for StSR, the CAH predicts that children will not have any difficulty either because A-movement from the embedded clause does not lead to misalignment between the thematic and grammatical hierarchies.

However, this has proved to be wrong in a number of experiments, already cited (Hirsch and Wexler, 2004, 2007, Hirsch, Orfitelli and Wexler, 2008), where it is clear that there is delay in acquiring StSR.

While Wexler adopted Chomsky's 2001 notion of the defective phase in formulating UPR, Hyams and Snyder adopt the syntactic assumptions put forth in Collins' (2005a, 2005b) "smuggling" account of verbal passives and StSR in the formulation of their hypothesis, the Universal Freezing Hypothesis (94).

(94)   Universal Freezing Hypothesis (UFH).For the immature child (at least until age four), the Freezing Principle *always* applies: No subpart of a moved phrase can *ever* be extracted. (Hyams and Snyder 2006: 13).

Hyams and Snyder (2005, 2006) propose that children apply the Freezing Principle developed in Wexler and Culicover (1980) and reformulated in Müller (1998) to all cases of movement, rendering further movement from already moved constituents impossible. Since Hyams and Snyder follow Collins' (2005b) smuggling account of passives, the derivation of verbal passives results in a minimality violation for premature children.

The UFH predicts no problem for unaccusatives, since their adult derivation does not involve movement from an already moved phrase, which would cause problems since that sort of movement requires an exception to Freezing.

Just like the UPR, the UFH predicts that, just like passives, subject raising over an experiencer-phrase (95) should be delayed. Examples (95) and (96) are taken from Hirsch *et al. (*2008).

(95)   Roger Clemens seems to fans to inject Human Growth Hormone.

Since raising over an experiencer is assumed by the UFH to involve smuggling the embedded subject past the experiencer, UFH hypothesizes that such sentences will be ungrammatical for premature child. Under the UFH account the semantically equivalent, but syntactically distinct unraised counterpart, (96) would not be ungrammatical for premature children.

(96)   It seems to fans (that) Roger Clemens injects Human Growth Hormone.

The UPR and the UFH make different predictions for raising when no experiencer is present. The UPR continues to predict delay since an agreement relationship needs to be established between matrix T and the embedded subject, regardless of the absence of an intervening experiencer. As for the UFH, if the experiencer is absent, then no Smuggling is required, and children should not be delayed.

Hirsch, Orfitelli, and Wexler (2007), in order to investigate the possibility that the presence of an experiencer-phrase was responsible for children's poor comprehension of raising, conducted an experiment to directly compare children's comprehension of raising with and without an experiencer phrase. They found that as predicted by both the UPR and the UFH, children perform quite poorly on raising structures with an experiencer-phrase, until around the age of six or seven. 40 children (12 boys, 28 girls) took part in the experiment (10 children in each one-year interval between four and seven years of age (4; 3 to 7; 9 years). In *unraised* trials, children performed well. Children performed extremely poorly on *raised items with an experiencer* with a sudden increase in comprehension just after age six similar to that which has been noted for verbal passives (Maratsos *et al*. 1985, Hirsch and Wexler

2007). As for raised items without an experiencer the accuracy was higher than for raising with an experiencer.

Developing Snyder and Hyams's (2005) hypothesis, and without considering the specific details associated with Smuggling and Freezing, Orfitelli (2012) formulated the Argument Intervention Hypothesis (Orfitelli 2012: 44), given in (97).

(97)   a.   for adults, verbal passives and experiencer-type subject-to-subject raising sentences (with *seem* and *appear*) require some (as of yet unspecified) syntactic operation that allows them to circumvent typical locality constraints on A- movement;

       b.   children do not have recourse to this syntactic mechanism.

Verbal passives, *seem*-type StSR and StSR with an experiencer are supposed to involve A-movement of one argument over another argument (Collins 2005a, b). Orfitelli refers to sentences with an overt experiencer as 'long', and those without one as 'short', in a direct parallel to the presence versus absence of the *by*-phrase in verbal passives. She accounts for the parallel delay in long and short *seem* StSR structures by assuming that there is a covert (i.e. syntactically projected but unpronounced) experiencer argument present in short raising sentences, analogous to the covert *by*-phrase proposed to exist in short verbal passives. In this way the AIH explains the children's delay in these constructions until approximately six or seven years old.

Be about-type StSR constructions are not delayed because they do not permit an experiencer argument. There is also early acquisition of constructions when there is A-movement without an intervening argument like for example, in VP-internal subject movement (98) and subject-to-object raising (StOR) (99). The following examples are taken from Orfitelli (2012).

(98)   Bruce is not eating the cake

(99)   Anton believes Eric to be smart.

Under the AIH unaccusative acquisition occurs early since unaccusatives involve only one argument, and therefore cannot lead to an intervention violation, that is, no argument intervenes between the base and final positions of the promoted argument.

Orfitelli shows that stative adjectival and resultative adjectival passives are structures that do not have an intervening argument. The AIH makes similar predictions to the result passive hypothesis of the UPR. Children subject to the AIH might be using an adjectival or resultative adjectival structure.

2.7. Evidence for verbal passives

Contra the generalization that there is delay in the acquisition of passives, there are different studies that report that English-speaking children are capable of comprehending verbal passives, and provide evidence that children may have verbal passive syntax.

Horgan (1978) showed that, although the rate was low, children as young as 2 could produce syntactically well formed long passives. In De Villiers' (1984) study, different groups of 3- to 4-year-olds repeated active or passive forms of sentences containing actional or non-actional verbs. Then they were asked to describe pictures depicting the sentences they had heard. They found that children primarily used the passives they had been trained on them, but did so quite prolifically. Crain, Thornton and Murasugi (1987, 2009) investigated English-speaking children's production of long passives. They designed an experiment to elicit full verbal passives from 35 preschool children. In their study they controlled the pragmatic context so that a question with a full passive would constitute a felicitous response. They showed that given the right felicity conditions, nearly every child they tested including some as young as 3; 4 could produce long passives. Crain, Thornton and Murasugi (2009) claim that passives are delayed until children attain certain levels of language processing. According to them the responsibility for slow acquisition of passives lies in the fact that there are cognitive processes extraneous to syntax that must be mastered before the passive can be fully acquired and that a maturation account need not be invoked. In their own words: 'the development of an efficient verbal-working memory system may establish a ceiling on children's performance at early stages of acquisition'. They focused on

whether children would produce passives with a *by*-phrase, but not on the issue of actional versus non-actional verbs. All of their examples used actional verbs and the passives produced by the children in their study were preferably *get*-passives as we can see in examples (100) and (101).

(100)   He got hurt by that guy.   (Todd 3;8)

(101)   Which car got pushed by a bus?   (Kyle 3;9)

Children have no difficulties with the get-passive in either production or comprehension. Many authors consider that get-passives have a similar structure to adjectival passives and thus lack A-chains. This view has been challenged by Fox and Grodzinsky (1998).

However, in some cases there was a relatively high rate of be-passives as in their subjects Phoebe and Jessica, who produced examples (102) and (103).

(102)   He was eaten by that ice-cream.   (Phoebe 3; 4)

(103)   Which one is not being hit by the monster?   (Jessica 3; 9)

There have also been developments in the implementation of Truth Value Judgement Tasks. O'Brien, Grolla, and Lillo-Martin (2006) make two hypotheses in connection with the delay of passive acquisition, reported in (104a-b).

(104)   a.   English-speaking children are not delayed in the acquisition of short non-actional be passives.

         b.   Previously found delays with long passives are due to a methodological flaw in the scenarios used in previous studies.

O'Brien, Grolla, and Lillo-Martin (2006) used a truth value judgment task that either had no extra agent/experiencer or an extra agent/experiencer. According to them the optionality of the *by*-phrase is crucial, since the *by*-phrase is used when there is potential confusion as to who the agent/experiencer might be. The relevant manipulation is not the addition of a character *per se*, rather the addition of a FOCUS

feature to the *by*-phrase. They set out to replicate Fox and Grodzinsky experiment. 12 children aged 3; 5-3; 11 and 11 children 4; 0- 4; 10 took part in the experiment. The authors found that 3-year-old children comprehend actional passives at a rate of almost 90%, and long non-actional passives at 82%. When no alternative agent/experiencer was present the rates fell. 3-year-olds correctly responded to non-actional passives at just over 60% and actional passives were slightly worse. It seems that adding a discourse feature of alternative agents yields improved performance with long passives. The result was replicated in Japanese: Takahashi (2009) conducted a Japanese version of O'Brien *et al.*'s TVJT: He used a felicity condition that contrasted possible agents. He found that Japanese-speaking children did well on long non-actional passives. These results are therefore problematic for the different accounts we have seen, especially the ACDH, the UPR and the Theta Transmission models.

The use of a psycholinguistic technique known as priming has also shown adult-like performance with passives in children even though their ability to produce passives and respond to experimental questions may be deficient (Bencini and Valian 2008). Bock (1986) showed that syntactic patterns can be primed. In order for something to be primed the participant must have some knowledge of it, otherwise the prime would have no effect on the participant. That is, syntactic priming is only effective if the syntactic competence for a particular construction is already in place. Bencini and Valian's results show that children as young as 3; 2 have knowledge of the passive. However, we must note that the observed priming effect held only when the sentences used inanimate subjects and objects and that the test items did not include non-actional verbs.

Earlier acquisition of verbal passives has been claimed for Sesotho (Demuth 1987), Inuktitut (Allen and Crago 1996), K'iche' Maya (Pie and Quixtar Pox 1988), Zulu (Suzan 1985), Kiswahili and Kigiriama (Alcock *et al.* 2011) but the evidence was controversial because the data was naturalistic (Crawford 2004, Johns 1992). In the absence of comprehension data, it is difficult to compare these findings to the data we have from other languages where delay is evident. The fact that children acquiring these languages produce passives indicates that some representation is available to them. However, it is unclear whether this representation has an underlying adult syntactic structure or an alternative one, as has been argued for English-speaking

children's early passive productions (Borer and Wexler 1987). Indeed, in the case of K'iche', a later comprehension study found a delay in passive comprehension (Pye, 1992), supporting the possibility that the children's spontaneous passive productions were not syntactically equivalent to those of the adults. Crawford (2005) makes the same argument in the case of early passive production in Sesotho, claiming that children's productions are predominantly 'resultative' passives (Embick 2004).

Demuth's *et al*. (2010) study of Sesotho passives had three parts: (i) a two-choice picture task, (ii) an elicited production task, and (iii) a novel verb task. Investigating long passives with a two-choice picture task modified with a felicity condition, they included a third character that could be a potential alternative agent/experiencer. The child participants included 16 Sesotho-speaking children between the ages of 2; 11 and 3; 5. The authors found that for Sesotho-speaking children the difference between actional passives (77%) and non-actional passives (69%) was not significant, and comprehension of non-actional passives was significantly above chance. According to the authors these results confirm that Sesotho-speaking 3-year-olds can comprehend full passives, even with non-actional verbs. The elicited production task targeted 12 actional verbs, 6 entailed a neutrally affected patient (like *kiss*) and 6 a negatively affected patient (like *bite*) although Sesotho does not exhibit any morphological or syntactical distinction between them. The reason for this split is that various researchers (Sugisaki 1999, among others) have claimed that adversity passives in languages like Japanese do not involve A-Movement leading to earlier acquisition. If Sesotho children were to produce large numbers of passives (in apparent contradiction with the ACDH and the UPR), it is possible that all such passives are negatively affected passives (like the adversity passives in Japanese), and therefore not contra the ACDH and UPR. Children were shown pictures, and each picture was described. They were then asked either agent-focused or patient-focused questions to elicit actives and passives, respectively. Children's performance was at ceiling, producing actives 95% with agent focused prompts and producing passives in 98% of questions with patient focused prompts. There was no difference in response rate with respect to positive versus negatively affected verbs, thus disproving the claim that Sesotho children's passives are essentially adversity passives.

In the novel verb task, which explored children's knowledge on two novel verbs, all 16 children successfully generalized the passive from the active (95%), and the active from the passive (99%). Of the sentences generalized from the active to the passive, 65% occurred with a full *by*-phrase. These results indicate that Sesotho-speaking children have mastered the passive and at an early age, presumably due to the high frequency of the passive in the input, and also due to methodological improvement such as the modified TVJT of O'Brien *et al.* (2006) and the structural priming study from Bencini and Valian (2008).

Contra Demuth (1989) Crawford (2005) challenges the supposedly early acquisition of verbal passives by Sesotho-learning children. She reanalyzes the original Sesotho transcripts, and finds that of the reported child-produced "passives", 22% are impersonal passives, which Demuth (1989) argues do not involve movement. Moreover, Crawford finds that approximately 30% of the reported passives are lexicalized forms, which allegedly do not involve *A*-chains. Finally, Crawford (2005) argues that between 32% and 56% of the passives in the speech of two of the children in the Sesotho corpus involve a morpheme that may be an applicative morpheme, which may carry an adversity reading. According to her, Sesotho children simply use adversity passives at young ages, but none of these require the movement of an argument into subject position

In another experiment, Crawford (2009) finds poor comprehension of long passives by Sesotho-speaking children up to the age of six years, despite using a similar methodology to that in Demuth *et al.'*s (2010) experiment. Demuth *et al.* found 77% accuracy on long actional passives, whereas Crawford found about 60% accuracy. Demuth *et al.* report 69% accuracy on long non-actional passives, and Crawford found about 40%. One big difference between both studies is that the pictures used by Crawford featured two participants, while the pictures in Demuth's study included three, in line with the pragmatic constraints proposed by O'Brien, Grolla and Lillo-Martin (2006).

As we already know, Greek has morphologically distinct verbal and adjectival passives. Terzi and Wexler (2002) originally found poor performance on the unambiguously verbal passives. However, in a picture-matching task contrasting verbal and adjectival passives, Driva and Terzi (2007) did not find as low performance on

verbal passives of actional verbs. Their study was different from that in Terzi and Wexler (2002) because they tested both short and long passives. The experiment was a three-picture matching task. Performance was similar with long and short passives. Thus, in their results the presence or not of the *by*-phrase had no impact on the acquisition of passives. Also they found much better performance with verbal passives of actional verbs, when compared with the results in Terzi and Wexler (2002) and a less pronounced difference between verbal and adjectival passives of this study. See the results in Table 13.

Age groups N=10 each	*By*-phrase	Verbal Actional Verbs	Adjectival Actional verbs	Verbal non-actional verbs
1. 3;6-4;00M=3;7	Yes	0.68	0.78	0.45
	No	0.67	0.75	0.35
2. 4;1-4;10M=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;00M=6;00	Yes	0.85	0.87	0.55
	No	0.83	0.88	0.47

Table 13. Percentage of correct answers, Driva and Terzi (2007).

In the experiment Driva and Terzi also tested wh-passives providing the discourse features of [wh] and [focus] expected to improve performance according to Hyams and Snyder (2006) and Snyder and Hyams (2008), and also Wexler (2004).Their goal was to see whether A' to A movement is licit in children's grammar. They tested *wh*-passives on short passives, including both verbal and adjectival, passives. Table 14 reports the results.

Age groups N=10 (each)	*By*-phrase	Verbal actional verbs	Adjectival actional verbs	Verbal on-actional verbs
1. 3;6-4;00M=3;7	Declarative	0.68	0.78	0.45
	Interrogative	0.25	0.35	0.37
2. 4;1-4;10M=4;4	Declarative	0.68	0.77	0.35
	Interrogative	0.53	0.55	0.47
3. 4;11-5;8M=5;3	Declarative	0.67	0.90	0.45
	Interrogative	0.45	0.67	0.32
4. 5; 9-6; 6 M=6; 0	Declarative	0.85	0.87	0.55
	Interrogative	0.70	0.67	0.55

Table 14.   Correct responses on declarative and interrogative long passives.

These results show that except for the non-actional passives of the 2nd age group, children did worse at interrogative passives in all age groups. Wh- passive interrogatives did not grant better results than the corresponding non-interrogative passives. These results demonstrate that movement from an A' to and an A position is not allowed.

Italian is another language that morphologically distinguishes between verbal and adjectival passives. In Italian, the verb *venire* clearly indicates a verbal passive structure (105) and *essere* is used with adjectival passives (106).

(105)   In quale foto Marco viene spinto (da Sara)?

In which photo Marco comes pushed (by Sara)?

'In which photo is Marco pushed (by Sara)?'

(106)   In quale foto Marco è spinto (da Sara)?

in which picture Marco is pushed (by Sara)

'In which picture is Marco pushed (by Sara)?'

Volpato *et al. (*2011) adapted Driva and Terzi's picture matching experiment for Italian. They found that long passives are not significantly different from short passives. The most interesting results concerns the role of the variable 'auxiliary' in the comprehension of passive sentences. First, actional passive sentences with auxiliary *venire* are largely comprehended by Italian-speaking children (mean percentage of

accuracy 86%). Second, they found no difference in performance between verbal passives with *venire* and adjectival passives with *essere*, suggesting that the verbal passive interpretation is just as available to children as the adjectival passive reading. Therefore, there are arguments for and against the early acquisition of passives and for a delay of such acquisition.

Chapter 3. Goals of this thesis

3.1.   Catalan passives

The passive voice is one of the ways that verbs have to modify the relationship between the arguments and the predicate by morphological means. Bartra (2002) writes that in Catalan we can find (a) the passive with *ser* 'to be', called periphrastic passive; (b) the stative passive or resultative passive and (c) the pronominal construction with an unspecified subject. All examples in this section are taken from Bartra (2002).

The periphrastic passive (107) is formed with *ser* 'to be' as auxiliary and the past participle of the verb in the passive voice.

(107)   Els testimonis seran interrogats per la policia.

the witnesses will be questioned by the police

'The witnesses will be questioned by the police.'

We can find full passives (with a full *by* phrase) or truncated passives (without a *by* phrase). Truncated passives are more common since one of the main purposes of passivization is to suppress the external argument.

The periphrastic passive presents a number of syntactic and semantic restrictions. The complement introduced by *by* is optional except for creation verbs (*build, design, paint*, etc) which require the presence of an agent. It is not possible either to obtain a well-formed passive with any transitive verb. There are restrictions in passivization depending on the type of verbal action (Aktionsart or lexical aspect)

and the verbal aspect of the different verb tenses. Telic predicates, which normally take a definite complement, are easier to be construed in the passive than atelic predicates. Verbal tenses like the present and the imperfect, which can imply a habitual aspect value, give rise to an atelic interpretation of the predicate. Consequently, only a few predicates admit the periphrastic passive in present and imperfect.

(108)   *L'endoll va ser tocat pel nen imprudent.
          The plug PAST be touched by the boy careless
          'The plug was touched by the careless boy.'

Adjectival passives (109) involve the past participle of a transitive verb and the verb *estar* 'to be' as the auxiliary. It does not have a dynamic value, it is not focused on the final stage of the process but on the resulting situation after the process has finished. It is considered that a sentence with a past participle and an inanimate subject can take the verb *estar* 'to be' if it focuses on the result of the process, and if it has a merely descriptive meaning *ser* is preferable.

(109)   La porta està oberta.
          The door is open
          (There has been a process by which the door has been opened).

(110)   La porta és oberta.
          The door is open
          (Description of the state at a given moment).

Psychological verbs like *espantar* 'frighten', *preocupar-se* 'worry', that, apart from the causative transitive interpretation, have an Experimenter argument may be found in the adjectival passive (111-112).

(111)   Estic preocupat.

          Am worried

          'I'm worried.'

(112)   La meva mare està espantada.

          The my mother is frightened

          'My mother is frightened.'

Predicates that denote contact between two entities do not admit the adjectival passive (113-114).

(113)   *Aquest nen està besat.

          'This boy is kissed.'

(114)   *Aquesta taula està empesa.

          'This table is pushed.'

Pronominal constructions with an unspecified subject (115) constitute the third type of passives in Catalan. The common feature of these constructions is the fact that the third person reflexive clitic *se/es* blocks the appearance of a subject (agent or similar) and it is not interchangeable with first and second person reflexive pronouns.

(115)   Aquesta tela es ven molt bé.

          This fabric CL sells very well

          'This fabric sells very well.'

A pronominal verb is a verb with a clitic pronoun which does not establish any anaphoric relationship with any other phrase in the context and which appears in complementary distribution with the subject of the transitive. With transitive verbs, instead of the verb in the passive voice, the pronominal form is often used.

These passives can take agent-oriented adverbs or purpose clauses, which indicate the presence of a silent external argument (as in short passives, see Baker *et al.* 1998).

(116)   S'han destruït totes les proves (intencionadament/ per enganyar els inspectors).

One has destroyed all the evidence (intentionally/ to cheat the inspectors)

'The evidence have been destroyed (intentionally/ to cheat the inspectors.'

3.2.   Goals of this thesis

This thesis has four goals. The first one is to determine the presence of passive constructions in child speech and child directed speech in Catalan. We aim to search the CHILDES database to check the children's and adults' input and in this way to see whether and, if so, how often the passive constructions exemplified in the above section are used and heard by Catalan children.

A second goal is to make a complete study of the development of passive sentences in children ranging from 3 to 6 years of age, focusing on actional verbs, so as to see if there is delay in the acquisition of such constructions in Catalan and, if so, at what age these constructions are understood.

A third goal is to consider the hypothesis that children lack theta transmission but can resort to the preposition *by* assigning an agentive theta role to the DP in the *by*-phrase. This can be done in Majorcan Catalan since the preposition *de* 'by' is also used in agentive nominals.

Finally, a fourth goal is to see how well children fare with adjectival passives in Catalan compared to the truncated or short form of the passive. Borer and Wexler (1987) argued that children make use of an adjectival reading to understand short passives because of the s-homophony between these two constructions in English. In spite of the fact that Catalan passive adjectivals are not s-homophones of their short

passive counterparts, I investigate if children somehow interpret short passives as adjectival.

Chapter 4. Study of spontaneous production

A study of spontaneous production on what the children hear and produce at early ages is needed in order to know the frequency of a particular structure, in our case the different types of Catalan passives.

We know that children do not hear the passive as much as the active. Nevertheless, a small frequency does not entail delay in acquisition. For example, Brown (1973) investigated the acquisition of 14 morphemes in the speech of three children, Adam, Eve and Sarah from the CHILDES database (MacWhinney 2000) and found that the morphemes were acquired in order of most frequent to less frequent. However, other factors like semantic or paradigmatic complexity among others mitigated this effect. So, frequency of occurrence of grammatical morphemes in parental speech does not predict the order of acquisition of these morphemes, and this entails that acquiring these morphemes need not be driven by frequency in parental speech.

Optional Infinitives are an example where in spite of abundance in the stimulus children produce structures that are ungrammatical. Wexler (1990, 1992, 1993) first proposed an Optional Infinitive stage in child grammar. He also argued that the Optional Infinitive stage was a phenomenon found in the non-null subject languages (English, French, German, Dutch, English, Danish, Norwegian and Swedish). In general, in those languages that mark tense on the verb there is obligatory tense marking. However, children often omit tense from their verb in root clauses. Infinitives appear instead of tensed verbs, and in spite of these being ungrammatical, children appear to produce them. Thus, in spite of the fact that most of the verbs that children hear are finite, most of the verbs that the youngest children produce are non-finite. Clearly the

large number of non-finite verbs does not follow from some kind of "learning" or environmental experience. This in Wexler's view supports the theory for maturation.

4.1. Study of spontaneous production of passives

The objective of this section is to consider the frequency of passive constructions in Catalan. The investigation is based on the speech of 6 Catalan-speaking children (Jordina, Júlia, Àlvar, Gisela, Guillem, Laura) and their interlocutors, from the corpora Jordina, Júlia and Serra, all available through CHILDES (MacWhinney and Snow (1985)). The transcriptions of the Catalan corpora were analyzed in search of utterances in the passive voice (periphrastic, adjectival and pronominal) and utterances with the preposition *per* ('by'). A total of 23,059 utterances produced by children and 38,991 utterances produced by adults were analyzed.

Table 15 summarizes the child data used for the analysis. It includes information about the files used, and the age range for the children during the period investigated. The adult production examined was taken from the same files.

Name	Files	Age Range
Jordina	1,2,3,4,5,6,7,8,9,10,11	1;7,16-2;10,16
Júlia	107,108a,108b,109a,109b,110,111a,111b, 200a,200b,201a,201b,202,203,204,205,206	1;7,19-2;6,25
Àlvar	14,15,16,17,18,19,20,24,25,26,27-1,27-2,28,29,30,31,32,33,35,36,37	1;2,28-3;1,13
Gisela	19,20,21,22,23,24,25,26,28,30,32,33,35, 37,41,42,46,48,49,50	1;7,14-4;2,03
Guillem	16,17,19,20,21,22,23,24,25,26,27a,27b, 28,29,30a,30b,30c,31,32,33,34,35a,35b,35c, 36,37,39,40,42,43,47,48,49	1;1,29-4; 0
Laura	20,21,22,23,26,27,28,29,30,31,32, 35,36,39,41,1;7,20-4;0,10 46a,46b,47,48	

Table 15.   Data used in the study.

For each file and child the MLU was calculated. Mean Length of Utterance (or MLU) is a measure of linguistic productivity in children. It is calculated by collecting

utterances spoken by a child and dividing the number of words by the number of utterances. A higher MLU is taken to indicate a higher level of language proficiency. As a rule, it can be ascertained that MLU increases as the child's age progresses. MLUs from each of the files analyzed can be found in Appendix A.

4.1.1. Method and results

I searched for verbal forms. When a sentence included more than one verb as in (117)

(117)   On puc amagar?
          Where can hide
          'Where can I hide?'   (Laura, Lau48.cha)

or

(118)   ho puc obrir, això?
          it can open this?
          Can I open this?   (Jordina, Jor11.cha)

two verbs were counted. 'Total number of verbs' includes forms of the verbs *ser* and *estar* 'to be', which are not included in 'total number of actives'.

For the periphrastic form a search was made seeking all forms of the verb *ser* 'to be'. Only two cases of periphrastic passive were found and both were adult utterances, children uttered none. The sentences are:

(119)   són, és comprats a Dinamarca.
          are, is bought-pl in Denmark
          'They are, it is bought in Denmark.'   (Investigator; file Gui40.cha)

(120)   ha sigut fet a fora.

         has been made PREP abroad

         'It has been made abroad.'   (Joan, father; Lau39.cha)

However, because of the oscillation between *ser* and *estar* in Catalan it is difficult to ascertain whether some sentences found are examples of periphrastic passive or not.

(121)   voleu ser separats?

         want be separated?

         'You want to be separated?'   (Gisela, Gis42.cha)

The context provided for this sentence is:

1150 *CHI: mira com esteu separats vosaltres [% "mia com teu separats vusatres"] .

1151 *CHI: xxx separats .

1152 *CHI: d' acord?

1153 *CHI: voleu ser separats, si o no?

1154 *CHI: m' ho fa &e +...

1155 *CHI: ben separats.

For the adjectival passive all forms of *estar* 'to be' were sought. As for pronominal passives we searched for the different forms in which the clitic *se* can appear (*se, es, s'*) and then a manual analysis was made to determine whether these were real pronominal passives. We found no real case of pronominal passive in the whole database.

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Table 16 records first usage of an adjectival passive for all the children.

CHILD	AGE	MLU
Jordina	1;7.16	2.045
Júlia	1;7.19	1.152
Àlvar	2;1.22	1.413
Gisela	2;2.06	1.500
Guillem	1;7.15	1.100
Laura	2;11.17	1.071

Table 16.　　　First occurrence of an adjectival passive.

4.1.2. Children's results for periphrastic, adjectival and pronominal passive

In Tables 17 to 22 all instances of active and passive sentences for the 6 children investigated are reported. In the column 'total number of verbs' copular verbs like ser, and *estar* 'to be' are included. In the column 'total number of actives' these have been not included. In Table 17 I report the results by file for Jordina.

Name	File	Age	Total Number of utterances	Total Number of verbs	Total Number of actives	Total Number of verbal passives	Total Number of adjectival passives	Total Number of pronominal passives
Jordina	Jor01.cha	1;7.16	223	41	39	0	2	0
Jordina	Jor02.cha	1;7.23	177	30	28	0	1	0
Jordina	Jor03.cha	1;8.03	201	35	33	0	2	0
Jordina	Jor04.cha	1;8.27	210	27	22	0	0	0
Jordina	Jor05.cha	1;9.11	245	80	69	0	0	0
Jordina	Jor06.cha	1;9.25	260	64	51	0	0	0
Jordina	Jor07.cha	1;10,24	230	150	119	0	0	0
Jordina	Jor08.cha	1;11.06	147	58	47	0	0	0
Jordina	Jor09.cha	2;7.09	467	255	209	0	4	0
Jordina	Jor10.cha	2;9.18	174	110	74	0	1	0
Jordina	Jor11.cha	2;10.16	179	123	23	0	7	0

Name	File	Age	Total Number of utterances	Total Number of verbs	Total Number of actives	Total Number of verbal passives	Total Number of adjectival passives	Total Number of pronominal passives
TOTAL			2,513	943	714	0	16	0

<div align="center">Table 17.   Jordina</div>

In Table 18 I report the results by file for Júlia.

Name	File	Age	Total number of utterances	Total number of verbs	Total number of actives	Total number of verbal passives	Total number of adjectival passives	Total number of pronominal passives
Júlia	Jul107.cha	1;7.19	33	0	0	0	1	0
Júlia	Jul108a.cha	1;8.08	10	0	0	0	0	0
Júlia	Jul108b.cha	1;8.21	18	2	2	0	0	0
Júlia	Jul109a.cha	1;9.13	27	12	11	0	1	0
Júlia	Jul109b.cha	1;9.28	35	19	19	0	0	0
Júlia	Jul110.cha	1;10.24	32	14	14	0	0	0
Júlia	Jul111a.cha	1;11.10	32	15	15	0	0	0
Júlia	Jul111b.cha	1;11.23	108	24	24	0	0	0
Júlia	Jul200a.cha	2;0.13	88	30	28	0	2	0
Júlia	Jul200b.cha	2;0.26	128	32	31	0	2	0
Júlia	Jul201a.cha	2;1.11	324	80	79	0	0	0
Júlia	Jul201b.cha	2,1.25	169	52	48	0	1	0
Júlia	Jul202.cha	2;2.11	186	69	67	0	1	0
Júlia	Jul203.cha	2;3.10	192	70	70	0	0	0
Júlia	Jul204.cha	2;4.08	203	78	78	0	1	0
Júlia	Jul205.cha	2;5.08	210	85	83	0	10	0
Júlia	Jul206.cha	2;6.25	209	95	76	0	1	0
TOTAL			2,004	677	645	0	20	0

<div align="center">Table 18.   Júlia</div>

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In Table 19 I report the results by file for Àlvar.

Name	File	Age	Total number of utterances	Total number of verbs	Total number of actives	Total number of verbal passives	Total number of adjectival passives	Total number of pronominal passives
Àlvar	Alv14.cha	1;2.28	107	2	0	0	0	0
Àlvar	Alv15.cha	1;3.18	72	0	0	0	0	0
Àlvar	Alv16.cha	1;4.08	95	0	0	0	0	0
Àlvar	Alv17.cha	1;5.01	111	0	0	0	0	0
Àlvar	Alv18.cha	1;5.27	32	2	0	0	0	0
Àlvar	Alv19.cha	1;7.13	33	0	0	0	0	0
Àlvar	Alv20.cha	1;8.14	28	0	0	0	0	0
Àlvar	Alv24.cha	1;11.27	64	0	0	0	0	0
Àlvar	Alv25.cha	2;1.22	121	4	1	0	1	0
Àlvar	Alv26.cha	2;2.06	134	23	14	0	0	0
Àlvar	Alv27-1.cha	2;2.28	160	61	44	0	0	0
Àlvar	Alv27-2.cha	2;3.16	129	42	36	0	0	0
Àlvar	Alv28.cha	2;4.07	85	39	35	0	0	0
Àlvar	Alv29.cha	2;5.13	110	36	27	0	1	0
Àlvar	Alv30.cha	2;6.25	140	37	30	0	0	0
Àlvar	Alv31.cha	2;7.16	124	41	34	0	0	0
Àlvar	Alv32.cha	2;7.29	68	33	23	0	2	0
Àlvar	Alv33.cha	2;9.11	47	29	22	0	0	0
Àlvar	Alv35.cha	2;11.13	68	39	34	0	1	0
Àlvar	Alv36.cha	3;0.13	103	39	32	0	0	0
Àlvar	Alv37.cha	3;1.13	33	19	18	0	1	0
TOTAL			1,864	446	350	0	6	0

Table 19.   Àlvar

In Table 20 I report the results by file for Gisela.

Name	File	Age	Total number of utterances	Total number of verbs	Total number of actives	Total number of verbal passives	Total number of adjectival passives	Total number of pronominal passives
Gisela	Gis19.cha	1;7.14	46	1	0	0	0	0
Gisela	Gis20.cha	1;8.03	169	7	7	0	0	0
Gisela	Gis21.cha	1;8.24	221	11	11	0	0	0
Gisela	Gis22.cha	1;9	64	5	4	0	0	0
Gisela	Gis23.cha	1;10.07	355	21	7	0	0	0
Gisela	Gis24.cha	1;11.11	180	5	0	0	0	0
Gisela	Gis25.cha	2;1.23	36	10	6	0	0	0
Gisela	Gis26.cha	2;2.06	206	43	28	0	1	0
Gisela	Gis28.cha	2;4.25	289	51	28	0	2	0
Gisela	Gis30.cha	2;6.23	72	29	25	0	0	0
Gisela	Gis32.cha	2;8	517	225	169	0	0	0
Gisela	Gis33.cha	2;9.16	291	148	112	0	0	0
Gisela	Gis35.cha	2;11	225	92	80	0	0	0
Gisela	Gis37.cha	3;0.29	35	24	14	0	0	0
Gisela	Gis41.cha	3;5.15	213	84	56	0	1	0
Gisela	Gis42.cha	3;6.28	620	397	324	1	5	0
Gisela	Gis46.cha	3;10.02	541	246	217	0	7	0
Gisela	Gis48.cha	3;11.14	509	229	180	0	6	0
Gisela	Gis49.cha	4;0.24	72	30	20	0	0	0
Gisela	Gis50.cha	4;2.03	95	38	37	0	0	0
TOTAL			4,756	1,696	1,325	0	22	0

Table 20. Gisela

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In Table 21 I report the results by file for Guillem.

Name	File	Age	Total number of utterances	Total number of verbs	Total number of actives	Total number of verbal passives	Total number of adjectival passives	Total number of pronominal passives
Guillem	Gui16.cha	1;1,29	43	3	3	0	0	0
Guillem	Gui17.cha	1;4.26	123	3	3	0	0	0
Guillem	Gui19.cha	1;7,15	30	2	1	0	1	0
Guillem	Gui20.cha	1;8	77	19	11	0	0	0
Guillem	Gui21.cha	1;9,12	108	27	24	0	0	0
Guillem	Gui22.cha	1;9,24	28	12	12	0	0	0
Guillem	Gui23.cha	1;11,13	79	41	35	0	1	0
Guillem	Gui24.cha	2;0,12	103	15	15	0	0	0
Guillem	Gui25.cha	2;1,14	264	19	19	0	0	0
Guillem	Gui26.cha	2;2,11	75	13	10	0	0	0
Guillem	Gui27a.cha	2;2,28	306	15	12	0	0	0
Guillem	Gui27b.cha	2;3,12	81	6	6	0	0	0
Guillem	Gui28.cha	2;3,18	234	29	23	0	0	0
Guillem	Gui29.cha	2;4,24	298	36	28	0	0	0
Guillem	Gui30a.cha	2;5,25	158	28	13	0	0	0
Guillem	Gui30b.cha	2;5,29	188	29	15	0	0	0
Guillem	Gui30c.cha	2;6,10	206	37	23	0	0	0
Guillem	Gui31.cha	2;7,09	210	42	30	0	1	0
Guillem	Gui32.cha	2;7,25	266	76	53	0	0	0
Guillem	Gui33.cha	2;9,08	272	104	97	0	0	0
Guillem	Gui34.cha	2;10,03	69	31	26	0	0	0
Guillem	Gui35a.cha	2;11,05	114	38	31	0	0	0
Guillem	Gui35b.cha	2;11,21	119	79	59	0	0	0
Guillem	Gui35c.cha	2;11,25	174	102	81	0	0	0
Guillem	Gui36.cha	3;0	8	4	3	0	0	0
Guillem	Gui37.cha	3;1,18	155	64	46	0	0	0
Guillem	Gui39.cha	3;3,19	154	56	49	0	5	0
Guillem	Gui40.cha	3;4,19	180	82	67	0	0	0
Guillem	Gui42.cha	3;6,11	212	94	88	0	0	0
Guillem	Gui43.cha	3;7,16	95	38	32	0	0	0

Name	File	Age	Total number of utterances	Total number of verbs	Total number of actives	Total number of verbal passives	Total number of adjectival passives	Total number of pronominal passives
Guillem	Gui47.cha	3;10,28	195	96	80	0	0	0
Guillem	Gui48.cha	3;11,20	253	119	106	0	1	0
Guillem	Gui49.cha	4; 0	17	7	6	0	0	0
TOTAL			4,775	1,366	1,107	0	9	0

<div align="center">Table 21.   Guillem</div>

In Table 22 I report the results by file for Laura.

Name	File	Age	Total number of utterances	Total number of verbs	Total number of actives	Total number of verbal passives	Total number of adjectival passives	Total number of pronominal passives
Laura	Lau20.cha	1;7,20	221	15	15	0	0	0
Laura	Lau21.cha	1;9,07	372	6	1	0	0	0
Laura	Lau22.cha	1;10,22	204	25	24	0	0	0
Laura	Lau23.cha	1;11,12	307	33	23	0	0	0
Laura	Lau26.cha	2;2,05	204	19	18	0	0	0
Laura	Lau27.cha	2;2,13	281	48	38	0	0	0
Laura	Lau28.cha	2;4,11	144	16	15	0	0	0
Laura	Lau29.cha	2;5,08	471	81	69	0	0	0
Laura	Lau30.cha	2;6,25	172	44	37	0	0	0
Laura	Lau31.cha	2;7,20	476	124	118	0	0	0
Laura	Lau32.cha	2;8,30	495	141	130	0	0	0
Laura	Lau35.cha	2;11,17	541	150	103	0	2	0
Laura	Lau36.cha	3;0,02	619	283	228	0	0	0
Laura	Lau39.cha	3;3,12	374	231	208	0	4	0
Laura	Lau41.chi	3;5,13	541	237	190	0	1	0
Laura	Lau46a.chi	3;10	587	239	205	0	4	0
Laura	Lau46b.chi	3;10,1	611	242	206	0	2	0
Laura	Lau47.chi	3;11,12	377	175	135	0	3	0
Laura	Lau48.chi	4;0,10	580	304	223	0	2	0

Name	File	Age	Total number of utterances	Total number of verbs	Total number of actives	Total number of verbal passives	Total number of adjectival passives	Total number of pronominal passives
TOTAL			7,147	2,413	1,986	0	18	0

Table 22.   Laura

4.1.3. Conclusions

There is only one case of verbal passive in the children files out of 23,059 utterances, example (121), which is a doubtful one. That is a rate of 1/23,059. As for adjectival passives there are 136 instances, which represent a 0.589% of the total number of utterances. As a consequence we can see that adjectival passives are far more common in children speech than verbal passives, which are almost if not fully absent.

4.1.4. Adults results for periphrastic, adjectival and pronominal passives

The following tables present the results of the utterances produced by adults. All children have been excluded from the recount. The results reflect only adult production (i.e. the interlocutors of the children investigated). The adults from which adult production has been analyzed are the same files from which the child production has been taken.

In Table 23 I report the results by file for adults in Jordina.

Name	File	Age	Total number of utterances	Total number of verbs	Total number of actives	Total number of verbal passives	Total number of adjectival passives	Total number of pronominal passives
Adult	Jor01.cha	1; 7. 16	341	351	260	0	4	0
Adult	Jor02.cha	1;7.23	315	381	303	0	2	0
Adult	Jor03.cha	1;8.03	306	370	298	0	5	0
Adult	Jor04.cha	1;8.27	534	786	609	0	2	0
Adult	Jor05.cha	1;9.11	380	390	339	0	10	0
Adult	Jor06.cha	1;9.25	500	552	467	0	3	0
Adult	Jor07.cha	1;10,24	206	224	183	0	1	0
Adult	Jor08.cha	1;11.06	235	331	289	0	3	0
Adult	Jor09.cha	2;7.09	895	948	738	0	8	0
Adult	Jor10.cha	2;9.18	354	432	335	0	3	0
Adult	Jor11.cha	2;10.16	360	416	320	0	4	0
TOTAL			4,426	5,181	4,141	0	45	0

Table 23.   Adults in the Jordina files

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In Table 24 I report the results by file for adults in Júlia.

Name	File	Age	Total number of utterances	Total number of verbs	Total number of actives	Total number of verbal passives	Total number of adjectival passives	Total number of pronominal passives
Adult	Jul107.cha	1;7.19	60	55	41	0	1	0
Adult	Jul108a.cha	1;8.08	22	20	17	0	0	0
Adult	Jul108b.cha	1;8.21	23	25	23	0	0	0
Adult	Jul109a.cha	1;9.13	40	40	32	0	1	0
Adult	Jul109b.cha	1;9.28	36	41	41	0	0	0
Adult	Jul110.cha	1;10.24	41	56	52	0	0	0
Adult	Jul111a.cha	1;11.10	40	59	59	0	0	0
Adult	Jul111b.cha	1;11.23	194	207	186	0	4	0
Adult	Jul200a.cha	2;0.13	174	191	185	0	2	0
Adult	Jul200b.cha	2;0.26	265	291	250	0	3	0
Adult	Jul201a.cha	2;1.11	537	677	620	0	5	0
Adult	Jul201b.cha	2,1.25	251	290	243	0	7	0
Adult	Jul202.cha	2;2.11	255	311	286	0	7	0
Adult	Jul203.cha	2;3.10	294	326	302	0	0	0
Adult	Jul204.cha	2;4.08	311	355	302	0	2	0
Adult	Jul205.cha	2,5.08	277	330	291	0	4	0
Adult	Jul206.cha	2;6.25	339	428	364	0	1	0
TOTAL			3,159	3,702	3,294	0	37	0

Table 24.   Adults in the Júlia files

In Table 25 I report the results by file for adults in Àlvar.

Name	File	Age	Total number of utterances	Total number of verbs	Total number of actives	Total number of verbal passives	Total number of adjectival passives	Total number of pronominal passives
Adult	Alv14.cha	1;2.28	431	323	235	0	2	0
Adult	Alv15.cha	1;3.18	69	52	44	0	2	0
Adult	Alv16.cha	1;4.08	286	261	202	0	0	0
Adult	Alv17.cha	1;5.01	107	18	8	0	0	0
Adult	Alv18.cha	1;5.27	93	69	52	0	3	0
Adult	Alv19.cha	1;7.13	66	30	20	0	0	0
Adult	Alv20.cha	1;8.14	58	67	54	0	4	0
Adult	Alv24.cha	1;11.27	200	106	82	0	0	0
Adult	Alv25.cha	2;1.22	254	237	207	0	1	0
Adult	Alv26.cha	2;2.06	282	188	154	0	3	0
Adult	Alv27-1.cha	2;2.28	322	341	280	0	1	0
Adult	Alv27-2.cha	2;3.16	198	72	60	0	0	0
Adult	Alv28.cha	2;4.07	283	208	181	0	0	0
Adult	Alv29.cha	2;5.13	319	247	202	0	4	0
Adult	Alv30.cha	2;6.25	333	147	119	0	1	0
Adult	Alv31.cha	2;7.16	807	386	335	0	0	0
Adult	Alv32.cha	2;7.29	242	185	152	0	1	0
Adult	Alv33.cha	2;9.11	57	48	39	0	1	0
Adult	Alv35.cha	2;11.13	77	57	53	0	2	0
Adult	Alv36.cha	3;0.13	153	127	116	0	1	0
Adult	Alv37.cha	3;1.13	57	66	62	0	1	0
TOTAL			4,691	3,235	2,657	0	27	0

Table 25.   Adults in the Àlvar files

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In Table 26 I report the results by file for adults in Gisela.

Name	File	Age	Total number of utterances	Total number of verbs	Total number of actives	Total number of verbal passives	Total number of adjectival passives	Total number of pronominal passives
Adult	Gis19.cha	1;7.14	129	58	58	0	0	0
Adult	Gis20.cha	1;8.03	510	161	149	0	0	0
Adult	Gis21.cha	1;8.24	351	109	95	0	1	0
Adult	Gis22.cha	1;9	255	149	136	0	0	0
Adult	Gis23.cha	1;10.07	541	237	174	0	0	0
Adult	Gis24.cha	1;11.11	294	221	198	0	3	0
Adult	Gis25.cha	2;1.23	115	85	65	0	0	0
Adult	Gis26.cha	2;2.06	473	312	267	0	1	0
Adult	Gis28.cha	2;4.25	567	292	201	0	0	0
Adult	Gis30.cha	2;6.23	270	272	229	0	0	0
Adult	Gis32.cha	2;8	875	712	590	0	2	0
Adult	Gis33.cha	2;9.16	342	233	186	0	3	0
Adult	Gis35.cha	2;11	347	258	213	0	5	0
Adult	Gis37.cha	3;0.29	37	34	21	0	0	0
Adult	Gis41.cha	3;5.15	350	326	270	0	0	0
Adult	Gis42.cha	3;6.28	493	424	367	0	3	0
Adult	Gis46.cha	3;10.02	624	478	416	0	10	0
Adult	Gis48.cha	3;11.14	392	321	256	0	4	0
Adult	Gis49.cha	4;0.24	124	96	77	0	0	0
Adult	Gis50.cha	4;2.03	136	175	154	0	2	0
TOTAL			7,225	4,953	4,122	0	34	0

Table 26.　　　　Adults in the Gisela files

In Table 27 I report the results by file for adults in Guillem.

Name	File	Age	Total number of utterances	Total number of verbs	Total number of actives	Total number of verbal passives	Total number of adjectival passives	Total number of pronominal passives
Adult	Gui16.cha	1;1,29	75	45	44	0	0	0
Adult	Gui17.cha	1;4.26	135	24	23	0	0	0
Adult	Gui19.cha	1;7,15	80	85	74	0	1	0
Adult	Gui20.cha	1;8	119	80	65	0	0	0
Adult	Gui21.cha	1;9,12	206	154	128	0	0	0
Adult	Gui22.cha	1;9,24	72	61	53	0	0	0
Adult	Gui23.cha	1;11,13	143	123	106	0	0	0
Adult	Gui24.cha	2;0,12	147	106	83	0	0	0
Adult	Gui25.cha	2;1,14	671	581	504	0	0	0
Adult	Gui26.cha	2;2,11	151	159	142	0	2	0
Adult	Gui27a.cha	2;2,28	655	588	525	0	1	0
Adult	Gui27b.cha	2;3,12	110	75	68	0	0	0
Adult	Gui28.cha	2;3,18	523	536	492	0	6	0
Adult	Gui29.cha	2;4,24	530	366	306	0	2	0
Adult	Gui30a.cha	2;5,25	315	316	273	0	2	0
Adult	Gui30b.cha	2;5,29	278	286	232	0	3	0
Adult	Gui30c.cha	2;6,10	245	227	214	0	1	0
Adult	Gui31.cha	2;7,09	390	423	331	0	2	0
Adult	Gui32.cha	2;7,25	334	294	247	0	0	0
Adult	Gui33.cha	2;9,08	427	405	333	0	0	0
Adult	Gui34.cha	2;10,03	71	101	87	0	0	0
Adult	Gui35a.cha	2;11.05	176	206	182	0	2	0
Adult	Gui35b.cha	2;11,21	182	165	127	0	0	0
Adult	Gui35c.cha	2;11,25	180	167	139	0	0	0
Adult	Gui36.cha	3; 0	15	14	13	0	0	0
Adult	Gui37.cha	3;1,18	88	71	63	0	0	0
Adult	Gui39.cha	3;3,19	44	45	37	0	0	0
Adult	Gui40.cha	3;4,19	394	446	394	1	3	0
Adult	Gui42.cha	3;6,11	404	359	304	0	0	0
Adult	Gui43.cha	3;7,16	111	98	88	0	0	0
Adult	Gui47.cha	3;10,28	153	147	128	0	0	0

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Name	File	Age	Total number of utterances	Total number of verbs	Total number of actives	Total number of verbal passives	Total number of adjectival passives	Total number of pronominal passives
Adult	Gui48.cha	3;11,20	371	389	334	0	2	0
Adult	Gui49.cha	4; 0	11	15	13	0	0	0
TOTAL			7,806	7,157	6,152	1	27	0

Table 27.   Adults in the Guillem files

In Table 28 I report the results by file for adults in Laura.

Name	File	Age	Total number of utterances	Total number of verbs	Total number of actives	Total number of verbal passives	Total number of adjectival passives	Total number of pronominal passives
Adult	Lau20.cha	1;7,20	452	329	295	0	0	0
Adult	Lau21.cha	1;9,07	728	573	502	0	0	0
Adult	Lau22.cha	1;10,22	618	459	430	0	0	0
Adult	Lau23.cha	1;11,12	932	640	508	0	0	0
Adult	Lau26.cha	2;2,05	480	334	288	0	0	0
Adult	Lau27.cha	2;2,13	5	3	2	0	0	0
Adult	Lau28.cha	2;4,11	23	12	10	0	0	0
Adult	Lau29.cha	2;5,08	865	784	611	0	2	0
Adult	Lau30.cha	2;6,25	301	358	311	0	0	0
Adult	Lau31.cha	2;7,20	1011	815	724	0	13	0
Adult	Lau32.cha	2;8,30	876	846	734	0	0	0
Adult	Lau35.cha	2;11,17	1035	1090	908	0	2	0
Adult	Lau36.cha	3;0,02	1000	898	777	0	1	0
Adult	Lau39.cha	3;3,12	496	436	397	1	7	0
Adult	Lau41.cha	3;5,13	494	447	370	0	0	0
Adult	Lau46a.cha	3;10	741	743	655	0	4	0
Adult	Lau46b.cha	3;10,1	916	891	778	0	3	0
Adult	Lau47.cha	3;11,12	380	384	292	0	2	0
Adult	Lau48.cha	4;0,10	331	373	326	0	0	0
			11,684	10,415	8,918	1	34	0

Table 28.   Adults in the Laura files

4.1.5. Conclusions

In the case of adults there are only two cases of verbal passive out of 38,991 utterances, corresponding to examples (119) and (120). That is a 0.00005%. As for adjectival passives there are 204 instances, which represent a 0.523%. It can be said that adults do not use the passive as a rule and children are, therefore, not exposed to passive sentences utterances, either.

4.2. Study of spontaneous production of the prepositions *per/pel/pels*

When the preposition *per* is followed by the masculine singular article *el* ('the') we get the contraction *pel,* in the plural form *pels.* A total of 23,059 utterances produced by children and 38,991 utterances produced by adults were analyzed. We sought all instances of *per/pel/pels* in the files. The different categories of the preposition *per/pel/pels* were classified as Agent, Goal + INF, Path, Goal + DP and Other.

Agents introduced by *pel* are exemplified in (122).

(122)   El llibre va ser escrit pel meu pare.

the book PAST TO BE written by my father

'The book was written by my father.'

Goal + INF is exemplified in (123).

(123)   Va sortir per comprar pa.

PAST go out to buy bread

'He went out to buy bread.'

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Path is exemplified in (124).

(124)　　Va caure quan anava pel carrer.

　　　　he fell when PAST go PREP street

　　　　'He fell when he was going down the street.'

Goal + DP is exemplified in (125).

(125)　　Això és per la meva mare.

　　　　this is for the my mother

　　　　'This is for my mother.'

Into the Other category fell the cases which do not involve thematic assignment, like idioms such as (126):

(126)　　Per casualitat.

　　　　'By chance.'

4.2.1. Children results for the prepositions per/pel/pels

The following tables present the results for *per/pel/pels* in the utterances produced by the children.

In Table 29 I report the results by file for Jordina.

Name	File	Age	Total number of utterances	Total number of *per agent*	Total number of *per purpose*	Total number of *per* path	Total number of *per* goal	Total number of *per* other
Jordina	Jor01.cha	1; 7. 16	223	0	0	0	0	0
Jordina	Jor02.cha	1;7.23	177	0	0	0	0	0
Jordina	Jor03.cha	1;8.03	201	0	0	3	0	0
Jordina	Jor04.cha	1;8.27	210	0	0	0	0	0

Name	File	Age	Total number of utterances	Total number of *per* agent	Total number of *per* purpose	Total number of *per* path	Total number of *per* goal	Total number of *per* other
Jordina	Jor05.cha	1;9.11	245	0	1	0	0	0
Jordina	Jor06.cha	1;9.25	260	0	0	0	0	0
Jordina	Jor07.cha	1;10,24	230	0	1	0	0	0
Jordina	Jor08.cha	1;11.06	147	0	0	0	0	0
Jordina	Jor09.cha	2;7.09	467	0	4	0	3	0
Jordina	Jor10.cha	2;9.18	174	0	2	0	1	0
Jordina	Jor11.cha	2;10.16	179	0	5	9	2	0
TOTAL			2,513	0	13	12	6	0

Table 29.   Jordina

In Table 30 I report the results by file for Júlia.

Name	File	Age	Total number of utterances	Total number of *per* agent	Total number of *per* purpose	Total number of *per* path	Total number of *per* goal	Total number of *per* other
Júlia	Jul107.cha	1;7.19	33	0	0	0	0	0
Júlia	Jul108a.cha	1;8.08	10	0	0	0	0	0
Júlia	Jul108b.cha	1;8.21	18	0	0	0	0	0
Júlia	Jul109a.cha	1;9.13	27	0	0	0	0	0
Júlia	Jul109b.cha	1;9.28	35	0	0	0	0	0
Júlia	Jul110.cha	1;10.24	32	0	0	0	0	0
Júlia	Jul111a.cha	1;11.10	32	0	0	0	0	0
Júlia	Jul111b.cha	1;11.23	108	0	0	0	0	0
Júlia	Jul200a.cha	2;0.13	88	0	0	0	0	0
Júlia	Jul200b.cha	2;0.26	128	0	0	0	0	0
Júlia	Jul201a.cha	2;1.11	324	0	0	0	0	0
Júlia	Jul201b.cha	2,1.25	169	0	0	0	0	0
Júlia	Jul202.cha	2;2.11	186	0	0	0	0	0
Júlia	Jul203.cha	2;3.10	192	0	0	1	0	0
Júlia	Jul204.cha	2;4.08	203	0	0	2	0	0
Júlia	Jul205.cha	2,5.08	210	0	0	4	0	0
Júlia	Jul206.cha	2;6.25	209	0	2	0	1	8

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Name	File	Age	Total number of utterances	Total number of *per* agent	Total number of *per* purpose	Total number of *per* path	Total number of *per* goal	Total number of *per* other
TOTAL			2,004	0	2	7	1	8

<div align="center">Table 30.　　Júlia</div>

In Table 31 I report the results by file for Àlvar.

Name	File	Age	Total number of utterances	Total number of *per* agent	Total number of *per* purpose	Total number of *per* path	Total number of *per* goal	Total number of *per* other
Àlvar	Alv14.cha	1;2.28	107	0	0	0	0	0
Àlvar	Alv15.cha	1;3.18	72	0	0	0	0	0
Àlvar	Alv16.cha	1;4.08	95	0	0	0	0	0
Àlvar	Alv17.cha	1;5.01	111	0	0	0	0	0
Àlvar	Alv18.cha	1;5.27	32	0	0	0	0	0
Àlvar	Alv19.cha	1;7.13	33	0	0	0	0	0
Àlvar	Alv20.cha	1;8.14	28	0	0	0	0	0
Àlvar	Alv24.cha	1;11.27	64	0	0	0	1	0
Àlvar	Alv25.cha	2;1.22	121	0	0	0	0	0
Àlvar	Alv26.cha	2;2.06	134	0	0	0	0	0
Àlvar	Alv27-1.cha	2;2.28	160	0	0	0	0	0
Àlvar	Alv27-2.cha	2;3.16	129	0	0	0	0	0
Àlvar	Alv28.cha	2;4.07	85	0	0	0	0	0
Àlvar	Alv29.cha	2;5.13	110	0	0	0	0	0
Àlvar	Alv30.cha	2;6.25	140	0	1	0	0	0
Àlvar	Alv31.cha	2;7.16	124	0	0	1	0	0
Àlvar	Alv32.cha	2;7.29	68	0	0	0	1	0
Àlvar	Alv33.cha	2;9.11	47	0	2	1	0	0
Àlvar	Alv35.cha	2;11.13	68	0	0	0	0	0
Àlvar	Alv36.cha	3;0.13	103	0	1	0	0	0
Àlvar	Alv37.cha	3;1.13	33	0	0	0	0	0
TOTAL			1,864	0	4	2	2	0

<div align="center">Table 31.　　Àlvar</div>

In Table 32 I report the results by file for Gisela.

Name	File	Age	Total number of utterances	Total number of *per* agent	Total number of *per* purpose	Total number of *per* path	Total number of *per* goal	Total number of *per* other
Gisela	Gis19.cha	1;7.14	46	0	0	0	0	0
Gisela	Gis20.cha	1;8.03	169	0	0	0	0	0
Gisela	Gis21.cha	1;8.24	221	0	0	0	0	0
Gisela	Gis22.cha	1;9	64	0	0	0	0	0
Gisela	Gis23.cha	1;10.07	355	0	0	0	0	0
Gisela	Gis24.cha	1;11.11	180	0	0	0	0	0
Gisela	Gis25.cha	2;1.23	36	0	0	0	0	0
Gisela	Gis26.cha	2;2.06	206	0	0	0	0	0
Gisela	Gis28.cha	2;4.25	289	0	0	0	0	0
Gisela	Gis30.cha	2;6.23	72	0	0	0	0	0
Gisela	Gis32.cha	2;8	517	0	4	0	1	0
Gisela	Gis33.cha	2;9.16	291	0	1	0	0	0
Gisela	Gis35.cha	2;11	225	0	1	0	0	2
Gisela	Gis37.cha	3;0.29	35	0	1	0	1	0
Gisela	Gis41.cha	3;5.15	213	0	0	0	0	0
Gisela	Gis42.cha	3;6.28	620	0	0	1	0	0
Gisela	Gis46.cha	3;10.02	541	0	1	6	3	0
Gisela	Gis48.cha	3;11.14	509	0	14	4	0	2
Gisela	Gis49.cha	4;0.24	72	0	0	0	0	0
Gisela	Gis50.cha	4;2.03	95	0	1	8	0	0
TOTAL			4,756	0	23	19	5	4

Table 32.   Gisela

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In Table 33 I report the results by file for Guillem.

Name	File	Age	Total number of utterances	Total number of *per agent*	Total number of *per purpose*	Total number of *per* path	Total number of *per* goal	Total number of *per* other
Guillem	Gui16.cha	1;1,29	43	0	0	0	0	0
Guillem	Gui17.cha	1;4.26	123	0	0	0	0	0
Guillem	Gui19.cha	1;7,15	30	0	0	0	0	0
Guillem	Gui20.cha	1;8	77	0	0	0	0	0
Guillem	Gui21.cha	1;9,12	108	0	0	0	0	0
Guillem	Gui22.cha	1;9,24	28	0	0	0	0	0
Guillem	Gui23.cha	1;11,13	79	0	0	0	0	0
Guillem	Gui24.cha	2;0,12	103	0	0	0	0	0
Guillem	Gui25.cha	2;1,14	264	0	0	0	1	0
Guillem	Gui26.cha	2;2,11	75	0	0	0	0	0
Guillem	Gui27a.cha	2;2,28	306	0	0	0	2	0
Guillem	Gui27b.cha	2;3,12	81	0	0	0	0	0
Guillem	Gui28.cha	2;3,18	234	0	0	0	0	0
Guillem	Gui29.cha	2;4,24	298	0	0	0	0	0
Guillem	Gui30a.cha	2;5,25	158	0	0	0	0	0
Guillem	Gui30b.cha	2;5,29	188	0	0	0	0	0
Guillem	Gui30c.cha	2;6,10	206	0	0	1	0	0
Guillem	Gui31.cha	2;7,09	210	0	0	1	0	0
Guillem	Gui32.cha	2;7,25	266	0	0	0	1	0
Guillem	Gui33.cha	2;9,08	272	0	0	0	3	0
Guillem	Gui34.cha	2;10,03	69	0	0	0	0	0
Guillem	Gui35a.cha	2;11.05	114	0	0	0	0	0
Guillem	Gui35b.cha	2;11,21	119	0	1	1	0	0
Guillem	Gui35c.cha	2;11,25	174	0	2	6	1	0
Guillem	Gui36.cha	3; 0	8	0	0	0	0	0
Guillem	Gui37.cha	3;1,18	155	0	1	1	6	1
Guillem	Gui39.cha	3;3,19	154	0	0	0	0	0
Guillem	Gui40.cha	3;4,19	180	0	0	0	1	0
Guillem	Gui42.cha	3;6,11	212	0	0	1	2	3
Guillem	Gui43.cha	3;7,16	95	0	0	1	0	0
Guillem	Gui47.cha	3;10,28	195	0	0	1	2	0

Name	File	Age	Total number of utterances	Total number of *per* agent	Total number of *per* purpose	Total number of *per* path	Total number of *per* goal	Total number of *per* other
Guillem	Gui48.cha	3;11,20	253	0	2	3	0	0
Guillem	Gui49.cha	4; 0	17	0	0	0	0	0
TOTAL			4,775	0	6	16	19	4

Table 33.   Guillem

In Table 34 I report the results by file for Laura.

Name	File	Age	Total number of utterances	Total number of *per* agent	Total number of *per* purpose	Total number of *per* path	Total number of *per* goal	Total number of *per* other
Laura	Lau20.cha	1;7,20	221	0	0	0	0	0
Laura	Lau21.cha	1;9,07	372	0	0	0	0	0
Laura	Lau22.cha	1;10,22	204	0	0	0	0	0
Laura	Lau23.cha	1;11,12	307	0	0	0	0	0
Laura	Lau26.cha	2;2,05	204	0	0	0	0	0
Laura	Lau27.cha	2;2,13	281	0	0	0	0	0
Laura	Lau28.cha	2;4,11	144	0	0	0	0	0
Laura	Lau29.cha	2;5,08	471	0	0	0	0	0
Laura	Lau30.cha	2;6,25	172	0	0	0	1	0
Laura	Lau31.cha	2;7,20	476	0	0	2	0	0
Laura	Lau32.cha	2;8,30	495	0	2	0	0	1
Laura	Lau35.cha	2;11,17	541	0	2	0	9	0
Laura	Lau36.cha	3;0,02	619	0	1	0	4	0
Laura	Lau39.cha	3;3,12	374	0	6	3	7	0
Laura	Lau41.cha	3;5,13	541	0	3	3	1	0
Laura	Lau46a.cha	3;10	587	0	5	5	2	2
Laura	Lau46b.cha	3;10,1	611	0	2	3	0	0
Laura	Lau47.cha	3;11,12	377	0	1	0	0	0
Laura	Lau48.cha	4;0,10	580	0	1	6	2	3
TOTAL			7,147	0	23	22	26	6

Table 34.   Laura

4.2.2. Conclusions

There are no cases of the preposition *per/pel/pels* used with an agentive meaning. The reason for this is that the only example of passive found was a short (non-truncated) passive. As for the distribution of *per* the most common interpretation given to it was path (with a total of 78 instances) followed by purpose (71 instances). This is summarized in Table 35.

Groups	*Per* purpose	*Per* path	*Per* goal	*Per* other
Jordina files	13	12	6	0
Júlia files	2	7	1	8
Àlvar files	4	2	2	0
Gisela files	23	19	5	4
Guillem files	6	16	19	4
Laura files	23	22	26	6
TOTAL	71	78	59	22

Table 35.   Distribution of the different interpretations of *per* by children.

4.2.3. Adults results for the prepositions *per/pel/pels*

The following tables present the results found for the utterances produced by the adults. All children have been excluded from the recount.

In Table 36 I report the results by file for the adults in the Jordina files.

Name	File	Age	Total number of utterances	Total number of *per* agent	Total number of *per* purpose	Total number of *per* path	Total number of *per* goal	Total number of *per* other
Adult	Jor01.cha	1; 7. 16	341	0	1	4	1	0
Adult	Jor02.cha	1;7.23	315	0	2	5	0	0
Adult	Jor03.cha	1;8.03	306	0	8	3	2	3
Adult	Jor04.cha	1;8.27	534	0	12	3	0	3
Adult	Jor05.cha	1;9.11	380	0	3	2	6	0
Adult	Jor06.cha	1;9.25	500	0	6	2	1	2

Name	File	Age	Total number of utterances	Total number of *per* agent	Total number of *per* purpose	Total number of *per* path	Total number of *per* goal	Total number of *per* other
Adult	Jor07.cha	1;10,24	206	0	3	0	5	0
Adult	Jor08.cha	1;11.06	235	0	4	1	5	1
Adult	Jor09.cha	2;7.09	895	0	19	3	30	7
Adult	Jor10.cha	2;9.18	354	0	4	2	2	1
Adult	Jor11.cha	2;10.16	360	0	11	7	2	0
TOTAL			4,426	0	73	32	54	17

Table 36. Adults in Jordina

In Table 37 I report the results by file for the adults in the Júlia files.

Name	File	Age	Total number of utterances	Total number of *per* agent	Total number of *per* purpose	Total number of *per* path	Total number of *per* goal	Total number of *per* other
Adult	Jul107.cha	1;7.19	60	0	0	0	0	1
Adult	Jul108a.cha	1;8.08	22	0	0	0	0	0
Adult	Jul108b.cha	1;8.21	23	0	0	0	0	0
Adult	Jul109a.cha	1;9.13	40	0	0	0	0	0
Adult	Jul109b.cha	1;9.28	36	0	0	0	0	0
Adult	Jul110.cha	1;10.24	41	0	0	0	0	1
Adult	Jul111a.cha	1;11.10	40	0	0	1	0	0
Adult	Jul111b.cha	1;11.23	194	0	1	1	0	1
Adult	Jul200a.cha	2;0.13	174	0	0	4	0	1
Adult	Jul200b.cha	2;0.26	265	0	4	4	0	0
Adult	Jul201a.cha	2;1.11	537	0	7	2	0	0
Adult	Jul201b.cha	2,1.25	251	0	4	2	0	0
Adult	Jul202.cha	2;2.11	255	0	4	1	2	1
Adult	Jul203.cha	2;3.10	294	0	3	3	5	0
Adult	Jul204.cha	2;4.08	311	0	1	7	1	1
Adult	Jul205.cha	2,5.08	277	0	1	2	6	1
Adult	Júlia206.cha	2;6.25	339	0	5	2	3	4
TOTAL			3,159	0	30	29	17	11

Table 37. Adults in Júlia

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In Table 38 I report the results by file for the adults in the Àlvar files.

Name	File	Age	Total number of utterances	Total number of *per agent*	Total number of *per purpose*	Total number of *per* path	Total number of *per* goal	Total number of *per* other
Adult	Alv14.cha	1;2.28	431	0	2	0	2	1
Adult	Alv15.cha	1;3.18	69	0	0	0	0	0
Adult	Alv16.cha	1;4.08	286	0	3	2	0	0
Adult	Alv17.cha	1;5.01	107	0	0	0	1	0
Adult	Alv18.cha	1;5.27	93	0	1	3	1	0
Adult	Alv19.cha	1;7.13	66	0	0	0	0	0
Adult	Alv20.cha	1;8.14	58	0	0	1	0	0
Adult	Alv24.cha	1;11.27	200	0	4	0	2	2
Adult	Alv25.cha	2;1.22	254	0	4	2	0	0
Adult	Alv26.cha	2;2.06	282	0	6	2	2	1
Adult	Alv27-1.cha	2;2.28	322	0	1	1	0	0
Adult	Alv27-2.cha	2;3.16	198	0	0	1	0	0
Adult	Alv28.cha	2;4.07	283	0	1	0	0	0
Adult	Alv29.cha	2;5.13	319	0	6	1	3	4
Adult	Alv30.cha	2;6.25	333	0	1	0	0	2
Adult	Alv31.cha	2;7.16	807	0	3	2	4	0
Adult	Alv32.cha	2;7.29	242	0	3	1	3	1
Adult	Alv33.cha	2;9.11	57	0	1	0	0	0
Adult	Alv35.cha	2;11.13	77	0	1	0	0	0
Adult	Alv36.cha	3;0.13	153	0	1	0	1	0
Adult	Alv37.cha	3;1.13	57	0	1	0	0	0
TOTAL			4,691	0	39	16	19	11

Table 38.   Adults in Àlvar

In Table 39 I report the results by file for the adults in the Gisela files.

Name	File	Age	Total number of utterances	Total number of *Per* agent	Total number of *Per* purpose	Total number of *Per* path	Total number of *Per* goal	Total number of *Per* other
Adult	Gis19.cha	1;7.14	129	0	0	0	0	0
Adult	Gis20.cha	1;8.03	510	0	1	0	0	0
Adult	Gis21.cha	1;8.24	351	0	0	0	0	0
Adult	Gis22.cha	1;9	255	0	0	2	0	3
Adult	Gis23.cha	1;10.07	541	0	0	1	0	0
Adult	Gis24.cha	1;11.11	294	0	2	5	0	0
Adult	Gis25.cha	2;1.23	115	0	0	0	0	0
Adult	Gis26.cha	2;2.06	473	0	2	3	3	1
Adult	Gis28.cha	2;4.25	567	0	1	2	0	0
Adult	Gis30.cha	2;6.23	270	0	0	0	6	1
Adult	Gis32.cha	2;8	875	0	0	5	1	1
Adult	Gis33.cha	2;9.16	342	0	0	1	0	0
Adult	Gis35.cha	2;11	347	0	0	0	0	1
Adult	Gis37.cha	3;0.29	37	0	2	0	0	1
Adult	Gis41.cha	3;5.15	350	0	8	2	1	1
Adult	Gis42.cha	3;6.28	493	0	9	4	1	1
Adult	Gis46.cha	3;10.02	624	0	7	2	2	7
Adult	Gis48.cha	3;11.14	392	0	15	7	3	2
Adult	Gis49.cha	4;0.24	124	0	1	0	0	1
Adult	Gis50.cha	4;2.03	136	0	0	6	0	1
TOTAL			7,225	0	48	40	17	21

Table 39.   Adults in Gisela

Actional Passives in Child Catalan

In Table 40 I report the results by file for the adults in the Guillem files.

Name	File	Age	Total number of utterances	Total number of *per agent*	Total number of *per purpose*	Total number of *per* path	Total number of *per* goal	Total number of *per* other
Adult	Gui16.cha	1;1,29	75	0	0	0	0	0
Adult	Gui17.cha	1;4.26	135	0	1	0	0	0
Adult	Gui19.cha	1;7,15	80	0	0	0	0	0
Adult	Gui20.cha	1;8	119	0	0	0	1	0
Adult	Gui21.cha	1;9,12	206	0	1	0	0	1
Adult	Gui22.cha	1;9,24	72	0	0	0	0	0
Adult	Gui23.cha	1;11,13	143	0	0	0	0	0
Adult	Gui24.cha	2;0,12	147	0	0	0	1	0
Adult	Gui25.cha	2;1,14	671	0	0	0	19	0
Adult	Gui26.cha	2;2,11	151	0	1	0	0	5
Adult	Gui27a.cha	2;2,28	655	0	0	3	4	1
Adult	Gui27b.cha	2;3,12	110	0	0	0	0	0
Adult	Gui28.cha	2;3,18	523	0	0	1	0	3
Adult	Gui29.cha	2;4,24	530	0	6	0	0	0
Adult	Gui30a.cha	2;5,25	315	0	0	2	0	2
Adult	Gui30b.cha	2;5,29	278	0	0	2	0	1
Adult	Gui30c.cha	2;6,10	245	0	0	2	0	0
Adult	Gui31.cha	2;7,09	390	0	7	3	1	0
Adult	Gui32.cha	2;7,25	334	0	2	1	2	0
Adult	Gui33.cha	2;9,08	427	0	5	0	7	1
Adult	Gui34.cha	2;10,03	71	0	1	0	0	1
Adult	Gui35a.cha	2;11.05	176	0	0	1	0	0
Adult	Gui35b.cha	2;11,21	182	0	0	7	0	1
Adult	Gui35c.cha	2;11,25	180	0	3	2	1	1
Adult	Gui36.cha	3; 0	15	0	0	0	0	0
Adult	Gui37.cha	3;1,18	88	0	2	0	4	0
Adult	Gui39.cha	3;3,19	44	0	0	0	0	0
Adult	Gui40.cha	3;4,19	394	0	4	2	2	1
Adult	Gui42.cha	3;6,11	404	0	4	0	2	1
Adult	Gui43.cha	3;7,16	111	0	0	2	0	0
Adult	Gui47.cha	3;10,28	153	0	1	0	0	1

Name	File	Age	Total number of utterances	Total number of *per* agent	Total number of *per* purpose	Total number of *per* path	Total number of *per* goal	Total number of *per* other
Adult	Gui48.cha	3;11,20	371	0	3	4	0	2
Adult	Gui49.cha	4; 0	11	0	0	0	0	0
TOTAL			7,806	0	41	32	44	22

Table 40. Adults in Guillem

In Table 41 I report the results by file for the adults in the Laura files.

Name	File	Age	Total number of utterances	Total number of *per* agent	Total number of *per* purpose	Total number of *per* path	Total number of *per* goal	Total number of *per* other
Adult	Lau20.cha	1;7,20	452	0	4	0	0	0
Adult	Lau21.cha	1;9,07	728	0	0	0	0	0
Adult	Lau22.cha	1;10,22	618	0	1	3	0	0
Adult	Lau23.cha	1;11,12	932	0	0	0	10	0
Adult	Lau26.cha	2;2,05	480	0	6	4	4	2
Adult	Lau27.cha	2;2,13	5	0	0	0	0	0
Adult	Lau28.cha	2;4,11	23	0	0	0	0	0
Adult	Lau29.cha	2;5,08	865	0	3	4	2	5
Adult	Lau30.cha	2;6,25	301	0	1	0	7	0
Adult	Lau31.cha	2;7,20	1011	0	5	6	2	2
Adult	Lau32.cha	2;8,30	876	0	4	4	0	1
Adult	Lau35.cha	2;11,17	1035	0	10	1	21	8
Adult	Lau36.cha	3;0,02	1000	0	7	2	1	3
Adult	Lau39.cha	3;3,12	496	0	8	2	8	1
Adult	Lau41.cha	3;5,13	494	0	1	3	0	1
Adult	Lau46a.cha	3;10	741	0	1	3	7	3
Adult	Lau46b.cha	3;10,1	916	0	7	4	0	5
Adult	Lau47.cha	3;11,12	380	0	3	2	1	1
Adult	Lau48.cha	4;0,10	331	0	1	3	2	5
TOTAL			11,684	0	62	41	65	37

Table 41. Adults in Laura

4.2.4. Conclusions

The most common interpretation that adults gave to *per* was purpose (with a total of 293 instances) followed by goal (216 instances). This is summarized in Table 42.

Adults groups	*Per* purpose	*Per* path	*Per* goal	*Per* other
Adults in Jordina files	73	32	54	17
Adults in Júlia files	30	29	17	11
Adults in Àlvar files	39	16	19	11
Adults in Gisela files	48	40	17	21
Adults in Guillem files	41	32	44	22
Adults in Laura files	62	41	65	37
TOTAL	293	190	216	119

Table 42.   Distribution of the different categories of *per* by adults.

In neither children nor in adult data did I find examples of *per/ pel/ pels* having the thematic role of agent. This is not surprising since as stated in the previous section no case of long passive was found in my search.

4.3.   Discussion

As we have seen in the results, children do not produce a single sentence in the passive and almost never hear passives in adult speech (we found only 2 instances of such). Consequently, the preposition *per/pel/pels* 'by', which is used in the *by*-phrase never appears as part of a long passive sentence and it does not appear in agentive nominals either, because this usage does not exist in Peninsular Catalan. In agentive nominals in Catalan the preposition *de* 'of' is used as shown in example (127).

(127)   el llibre d'en Pla

           the book PREP ART Pla

           'the book by Pla' or 'Pla's book'

On the other hand, we can find examples of the use of *per/pel/pels* in the categories of purpose, path, goal and other. These results can be compared to those of English by Hirsch and Wexler (2006b) who sought evidence for the *by*-phrase theory of Fox and Grodzinsky using natural speech, both in child-produced and child-directed utterances. Hirsch and Wexler searched the input and output of 1051 English-speaking children in the CHILDES corpus for all sentences containing the preposition *by*. This involved searching through 755,454 child-directed utterances and 414,014 child-produced utterances. First they searched for any examples of use or exposure to *by*-phrases in nominals (both simple and derived nominals), since such uses of *by* must be agentive. An example of a *by* phrase in a nominal is shown in example (128).

(128)   the book by Stendhal

No child produced even a single nominal *by*-phrase, nor did any child hear even a single such nominal *by*-phrase. While there were plenty of examples of other cases of semantically-contentful *by* (e.g. locative-*by* and temporal-*by*), there were no examples of agent-*by* in either child-produced or child-directed speech. Thus, there is no evidence from the English corpus research to suggest that children know *by* may assign an agent theta-role. The results coincide with ours in that respect.

Chapter 5. Experiment 1: Actional passives in Catalan

The aim of this experiment was to see whether Catalan children have the same difficulties understanding the passive as it is the case in children from other languages. It is well known that there is a delay in the comprehension of passive in a number of languages, there is a great deal of literature to that respect as we have shown in the background chapter. We set out to design an experiment that had as a source an experiment designed by COST Action A33 (Crosslinguistically Robust Stages of Children's Linguistic Performance). In this experiment the specific focus were children of ages 5 to 5; 11, and they were tested on their comprehension of actional passives (the results are to be found in Armon-Lotem (in press)). I run the experiment for COST and enlarged the population tested adding 3-, 4-, and 6-year-olds so that we could see their performance as they grew older. Adults were tested as well. Such an experiment had not been carried out in Catalan before. We decided to test only actional passives because they are easier to depict and consequently the children have no problems in understanding what is going on in the picture they are presented with, so the task is more easily comprehended and the results are more reliable.

5.1.   Predictions

If Wexler's UPR is right then young children (at least) up to age 5 take *v* to be a phase and, therefore, children under and of this age would have a delay in their comprehension. In short passives comprehension may still appear to be better due to the adjectival strategy already postulated by Borer and Wexler (1987). This is at least the case for a language such as English. Results would also improve with age as the

comprehension of phases mature with age following Wexler's hypothesis. According to this maturation hypothesis passives would appear suddenly.

According to Fox and Grodzinsky's Theta Transmission hypothesis short passives would be well understood because the problem lies with the *by*-phrase (in non-actionals). However, their proposal must be adapted to Peninsular Catalan for the simple reason that agentive nominals in peninsular Catalan are introduced with a preposition different from *by*, in this case *de* 'of'.

5.2. Experimental design

The test was a picture-matching task in which the children heard sentences in the active or passive while they looked at four pictures related to the sentence and they had to choose what picture was the one the sentence described. The sentences were semantically reversible, so that interpretation rested solely on grammatical knowledge.

There were always three characters on each picture. One picture showed the event in which the character corresponding to the subject was performing the action (correct answer), another picture showed the event in which the character corresponding to the object was performing the action (reverse answer), a third picture showed another character different from the two characters involved in the action (other person answer), and on the fourth picture none of the characters were performing any action at all (no action answer). To show this in a clearer way we can look at Figure 1. As we can see there are four pictures. When the children heard the recorded sentence: *El germà petit és abraçat per l'avi* 'The little brother is hugged by grandpa', they chose the picture that they thought was being described by the sentence.
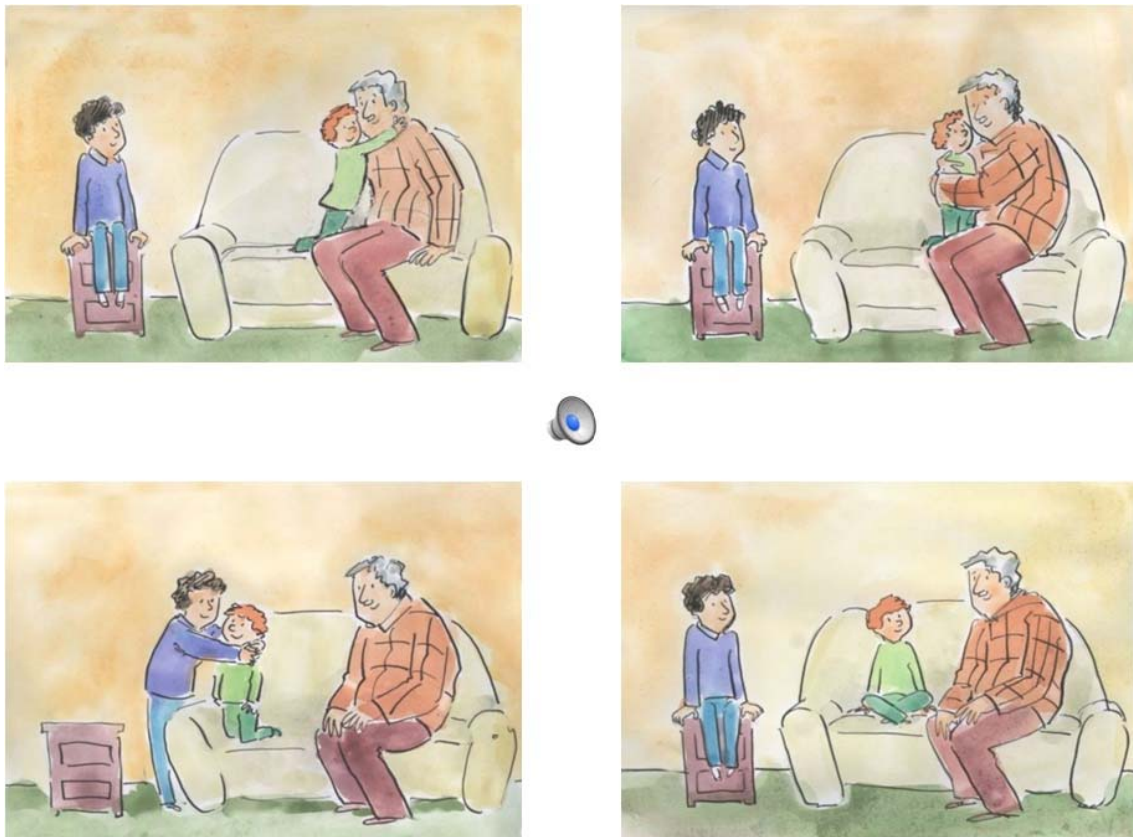
Figure 1.   El germà petit és abraçat per l'avi. 'The little boy is hugged by grandpa.'

The task comprised 22 sentences with male characters and 22 sentences with female characters, of which in each part there were 11 questions in the active and its 11 passive counterparts in random order, exemplified in (129) and (130) respectively.

(129)   El germà petit abraça l'avi.

          The brother little hugs the grandpa

          'The little brother is hugging grandpa. '

(130)   El germà petit és abraçat per l'avi.

          The brother little is hugged by the grandpa.

          'The little brother is hugged by grandpa.'

Sentences were presented in random order. A complete list of the items used can be found in Appendix C.

5.2.1. Procedure

Before starting the test the children got familiarized with the characters they were going to encounter in the experimental materials. The characters were described (grandfather, father, the elder brother and the younger brother), and then the children were asked to point at a particular member of the family, the grandfather, for instance, and the same went for the rest of the characters. The same procedure was followed with the female characters (grandmother, mother, elder sister and younger sister).

When the children could demonstrate that they knew the characters, we proceeded to the next stage (Part II). In this they saw 6 different pictures where two of the male characters they had identified before were performing some action, e.g. the elder brother tickling the younger brother, and they heard the corresponding recorded question: *Qui fa pessigolles a qui?* 'Who is tickling whom?' to which they had to respond and in this way demonstrate that they could distinguish the character who was acting as a subject or as an object of the action. In their answers they could mention both subject and object; only the subject; only the object; or another subject; and they could include or not the corresponding verbs in their answers. For every sentence there were a pair of pictures and a character played the role of subject in one picture (Figure 2a) and the role of object in the other picture, (Figure 2b).

a)   b)

Figure 2.   Qui fa pessigolles a qui? 'Who is tickling whom?'

When they had completed the set of pictures with male characters they proceeded to the set of pictures with female characters, which was similar only with female characters and different actions from the ones in the male part. If a child couldn't do well on either part he or she could not continue the test. Once the children had been trained in this recognition activity the actual test started. Complete list of items in Appendix B.

The experiment was presented to the children on a portable computer, and answers recorded by the experimenter on an answer sheet. Each test item was presented at most twice. The children were not corrected for wrong responses. Each child heard the sentences with the male characters and the female characters in the same session.

The test took about 20 minutes per child on average, and was run individually in a quiet room in the school. All of the children were acquiring Catalan as their first language and spoke Catalan at home at least to one parent.

5.2.2. Subjects

A total number of 173 children, aged 3, 4, 5, 6 and 40 adults, all native speakers of Catalan, were tested. All of them were tested on their comprehension of active sentences and on their comprehension of either truncated (short) or non-truncated (long) passives. Details of the subjects are shown in Table 43.

Age group	N	Mean age	Age range
3-year-old	42	3;5	3;1–3;11
4-year-olds	40	4;6	4;2–4;11
5-year-olds	51	5;6	5;1–5;11
6-year-olds	40	6;7	6;1–6;11
Adults	40		
Total	213		

Table 43.   Distribution of the whole age groups.

As for age, for children we have two categorizations in years: 'years young' and 'years older', where young is up to and including 6 months and older is from 7 months

up to and including 11 months. Differentiating between young and old within a year, the distribution is as shown in Table 44.

Age groups	N
3 Young	17
3 Older	25
4 Young	20
4 Older	20
5 Young	31
5 Older	20
6 Young	23
6 Older	17

Table 44.   Distribution of the split age groups.

5.2.3.   Statistical methods

We used the Generalised Linear Model and the Logistic Regression Model (McCullagh and Nelder 1989). All the results were obtained with SAS software 9.2 version (SAS System, Cary, NC, USA, 2009) and were performed by the Servei d'Estadística Aplicada of the UAB.

5.3.   Results

The overall results appear in Table 45.

	3-year-olds	4-year- olds	5-year-olds	6-year-olds	Adults
active	83.95%	94.20%	97.50%	99.77%	98.85%
Short passive	59.92%	72.40%	83.37%	96.59%	98.64%
long passive	23.40%	38.45%	29.49%	91.82	98.40

Table 45.   Percentage of correct answers, actives vs. passives.

Given that the variable of interest is the answer that the children have given, next are the tables of the descriptive statistics for the global number of correct answers according to age, including active and passive sentences. In Tables 46 and 47

we can see that the older the children, the more correct sentences they have answered.

Age years	N	Mean	Std Dev
3	42	27.24	6.28
4	40	32.73	6.84
5	51	32.53	8.41
6	40	42.68	3.16
Adults	40	43.35	1.00

Table 46.   Number of correct answers over 44 according to whole age groups.

Age groups	N	Mean	Std Dev
3 Young	17	25.65	6.64
3 Older	25	28.32	5.91
4 Young	20	30.65	6.39
4 Older	20	34.80	6.79
5 Young	31	33.71	8.39
5 Older	20	30.70	8.31
6 Young	23	42.39	3.89
6 Older	17	43.06	1.78
Adults	40	43.35	1.00

Table 47.   Number of correct answers over 44 according to split age groups.

For active sentences the results appear on Table 48. In column N are the total numbers of children that have answered. In general, children answered the active sentences quite well, with a slight increase of correct answers as age progresses.

Age years	N	Mean	Std Dev
3	42	83.95	17.77
4	40	94.20	8.30
5	51	97.50	3.78
6	40	99.77	1.00
Adult	40	98.85	2.01

Table 48.   Percentage of correct answers for active sentences according to whole age groups.

In Figure 3 we can see that the older the children, the more correct answers they give.
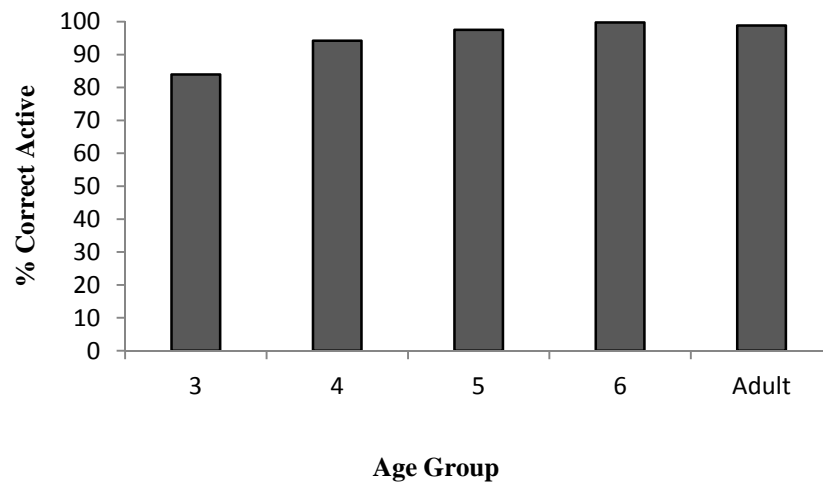
Figure 3. Percentage of correct answers for active sentences according to whole age groups.

If we differentiate between young and older groups, the results are shown in Table 49.

Age group	N	Mean	Std Dev
3 Young	17	76.84	24.73
3 Older	25	88.78	8.45
4 Young	20	94.32	6.74
4 Older	20	94.09	9.78
5 Young	31	97.21	4.34
5 Older	20	97.95	2.75
6 Young	23	99.60	1.31
6 Older	17	100.00	0.00
Adults	40	98.85	2.01

Table 49. Percentage of correct answers for active sentences according to split age groups.

As we can see in Figure 4 when we split the age groups in young and old, we can see that the 4-year-old young group performs slightly better than their older counterparts, while the 5-year-old young group and the 5-year-old old group perform

almost equally well and so do the 6-year-old young group and the 6-year-old older group.
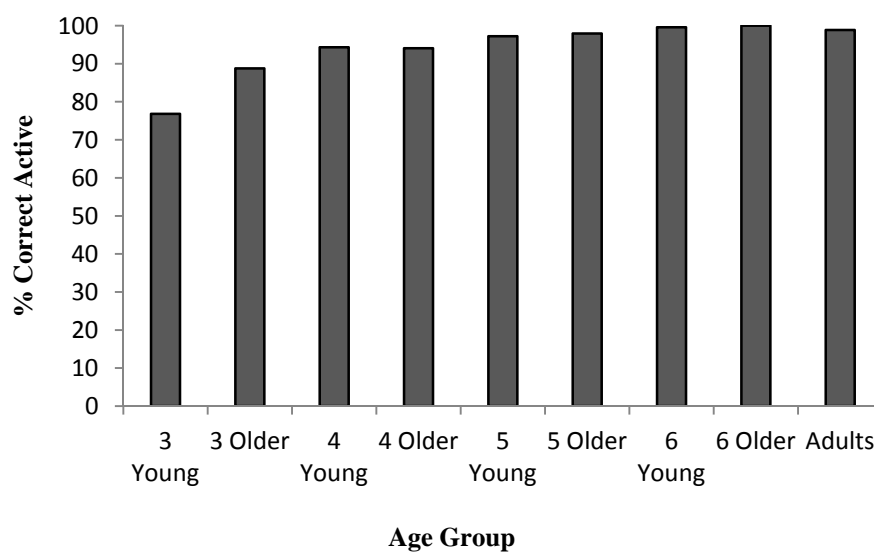
Figure 4.   Percentage of correct answers for active sentences according to split age groups.

As for short passive sentences, the results improve as children mature as can be seen in Table 50.

Age years	N	Mean	Std Dev
3	42	59.92	15.42
4	40	72.40	25.96
5	51	83.37	21.18
6	40	96.59	6.24
Adult	40	98.64	2.60

Table 50.   Percentage of correct answers for short passive sentences (whole age groups).

In Figure 5 we can see the graphic representation of percentage of correct answers for the whole age groups.
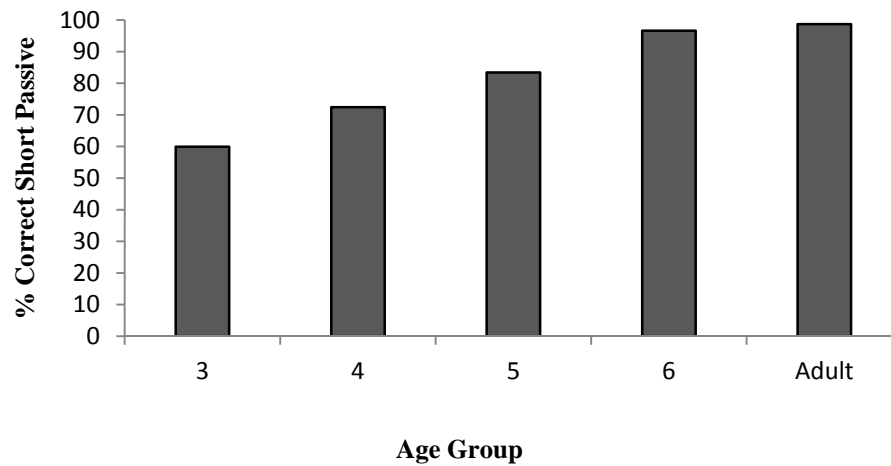
Figure 5.   Percentage of correct answers for short passive sentences (whole age groups).

If we differentiate between young and older, the results are shown in Table 51. We can see that, surprisingly, children aged 5 who belonged to the older group performed worse than children aged 4 who belonged to the older group in short passives. As expected, 6-year-olds performed better than 4-and 5-years-olds.

Age groups	N	Mean	Std Dev
3 Young	17	54.26	15.10
3 Older	25	63.69	15.06
4 Young	20	68.18	32.99
4 Older	20	74.67	22.53
5 Young	31	94.07	5.68
5 Older	20	72.66	25.68
6 Young	23	98.35	3.06
6 Older	17	94.44	8.44
Adult	40	98.64	2.60

Table 51.   Percentage of correct answers for short passive sentences (split age groups).

As can be seen graphically in Figure 6 the 5-year-old old group performs worse than the 5-year-old young group. As for the 6-year-olds the young group also performed better than the older group.
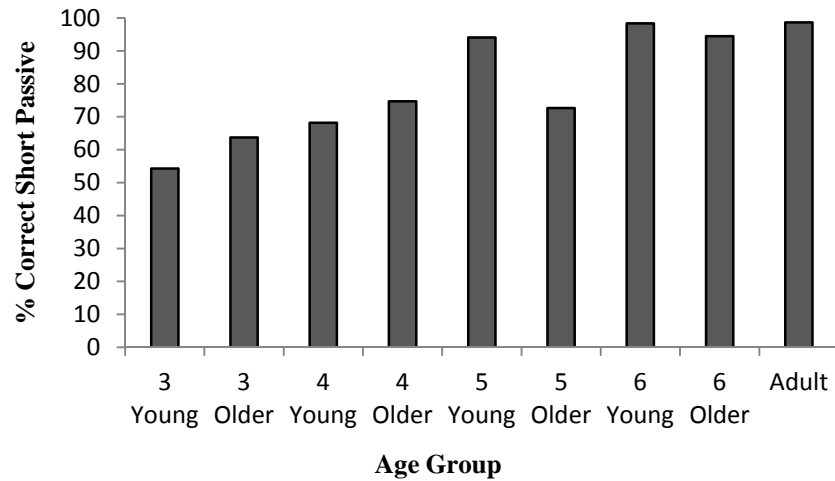
Figure 6.   Percentage of correct answers for short passive sentences (split age groups).

As for long passives, the results appear in Table 54, and we can see that children aged 5 performed well worse than children aged 4 in long passives. 6-year-olds performed better than 4-and 5-years-olds.

Age years	N	Mean	Std Dev
3	42	23.40	10.62
4	40	38.45	25.86
5	51	29.49	29.59
6	40	91.82	18.45
Adult	40	98.40	2.68

Table 52.   Percentage of correct answers for long passive sentences (whole age groups).

In Figure 7 we can see how 5-years-olds' performance is not as good as 4-year-olds' performance (as in previous cases, these differences may not reach significance).
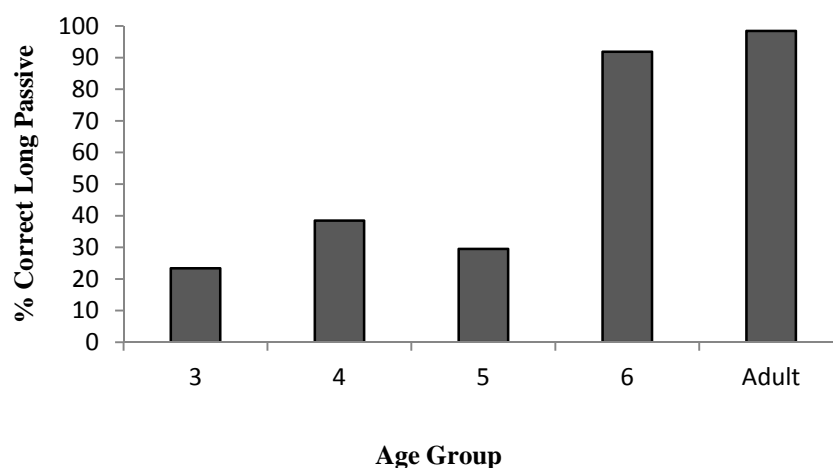
Figure 7.   Percentage of correct answers for long passive sentences (whole age groups).

If we differentiate between young and older, the results are shown in Table 53, the 3-year-old older group performs worse than the younger group, and 5-year-olds who belong to the older group perform well worse than their young group counterparts. 4-year-olds who belong to the older group perform better than the five-year-old whole group. Remarkably, there is a sudden great boost in the performance of the 6-year-old young group compared to the 5-year-old older group, (88.26% of correct answers to 11.36%, respectively). It seems that at 6 things fall into place and comprehension is adult-like.

Age groups	N	Mean	Std Dev
3 Young	17	27.90	9.70
3 Older	25	20.28	10.43
4 Young	20	32.52	20.73
4 Older	20	49.48	32.23
5 Young	31	38.12	31.75
5 Older	20	11.36	11.78
6 Young	23	88.26	22.64
6 Older	17	97.16	8.04
Adult	40	98.40	2.68

Table 53.   Percentage of correct answers for long passive sentences according to split age groups.

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This can be seen graphically in Figure 8.
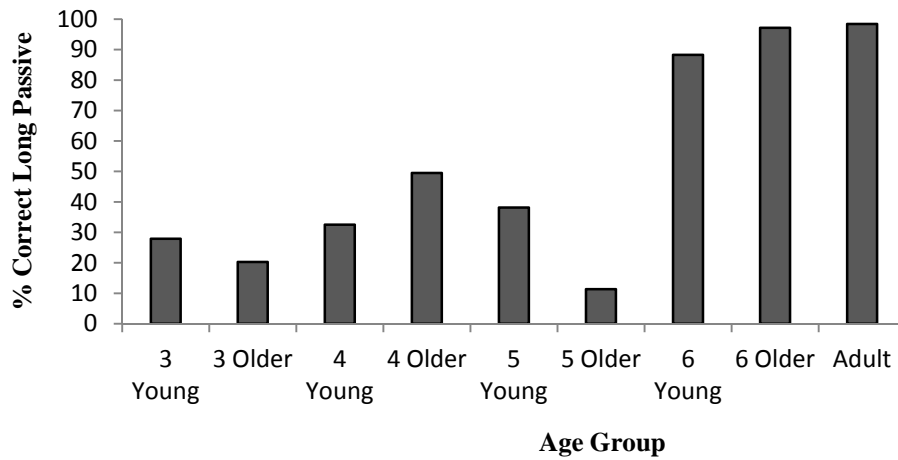
Figure 8.   Percentage of correct answers for long passive sentences according to split age groups.

As we can see in Table 54, the Reverse answer was overwhelmingly preferred over other errors especially in the long passive sentences where 3- and 5-year-old children performed very similarly.

Age group	Type of sentence	Type of wrong answer	N	Mean	Std
3	Active	Reverse	42	0.11	0.14
	Short passive	Reverse	20	0.28	0.13
	Long passive	Reverse	22	0.69	0.15
4	Active	Reverse	40	0.04	0.07
	Short passive	Reverse	20	0.21	0.25
	Long passive	Reverse	20	0.57	0.28
5	Active	Reverse	51	0.02	0.04
	Short passive	Reverse	20	0.14	0.20
	Long passive	Reverse	31	0.70	0.29
6	Active	Reverse	40	0.00	0.01
	Short passive	Reverse	20	0.03	0.05
	Long passive	Reverse	20	0.08	0.18
Adult	Active	Reverse	40	0.01	0.02
	Short passive	Reverse	20	0.00	0.01
	Long passive	Reverse	20	0.01	0.02

Table 54.   Proportion of Reverse answers by age.

The type of wrong answer 'Another Character' was not found except for the 3- and 4-year olds, and still very scarcely. See Table 55.

Age group	Type of sentence	Type of wrong answer	N	Mean	Std
3	Active	Another character	42	0.03	0.06
	Short passive	Another character	20	0.07	0.07
	Long passive	Another character	22	0.05	0.06
4	Active	Another character	40	0.01	0.02
	Short passive	Another character	20	0.03	0.05
	Long passive	Another character	20	0.04	0.06
5	Active	Another character	51	0.00	0.01
	Short passive	Another character	20	0.02	0.03
	Long passive	Another character	31	0.00	0.01
6	Active	Another character	40	0.00	0.00
	Short passive	Another character	20	0.00	0.00
	Long passive	Another character	20	0.00	0.01
Adult	Active	Another character	40	0.00	0.01
	Short passive	Another character	20	0.01	0.02
	Long passive	Another character	20	0.00	0.01

Table 55.   Proportion of Another Character by age.

As we can see in Table 56, 'No action' was the least attested wrong answer for ages 3 and 4. This error type was not found at all in the other age groups.

Age group	Type of sentence	Type of wrong answer	N	Mean	Std
3	Active	No action	42	0.02	0.05
	Short passive	No action	20	0.06	0.06
	Long passive	No action	22	0.03	0.07
4	Active	No action	40	0.01	0.02
	Short passive	No action	20	0.04	0.05
	Long passive	No action	20	0.01	0.03
5	Active	No action	51	0.00	0.01
	Short passive	No action	20	0.01	0.02
	Long passive	No action	31	0.00	0.01
6	Active	No action	40	0.00	0.01
	Short passive	No action	20	0.00	0.01
	Long passive	No action	20	0.00	0.00
Adult	Active	No action	40	0.00	0.00
	Short passive	No action	20	0.00	0.00
	Long passive	No action	20	0.00	0.01

Table 56. Proportion of No action answers by age.

In the analysis by type of sentence very significant statistical differences between the active and the passive sentences were found. The quantification of this difference can be found in the odds ratio statistic which expresses how high the chances of obtaining a correct answer for an active sentence are compared to those of a passive sentence. As can be seen in Table 57, we find that the odds of obtaining a correct answer for an active sentence are 19 times higher than those for a passive sentence. Therefore, regarding the performance of the children, the effect of type of sentence was statistically significant: actives were understood better than passives (OR = 19.389, CI $_{95\%}$= (16.345, 23.001)). See Table 57.

Type	Type	Odds Ratio	Lower Odds Ratio	Upper Odds Ratio
active	passive	**19.389**	**16.345**	**23.001**

Table 57. Active vs. Passive sentences.

There were also very significant statistical differences among the active, short passive and long passive sentences. As can be seen in Table 58, for an active sentence we find an odds 5 times higher of getting a correct answer than for a short passive; comparing actives and long passives, the odds increase considerably, being 45 times higher. Between short and long passives the odds ratio is 8.7.

Type	Type	Odds Ratio	Lower Odds Ratio	Upper Odds Ratio
Active	Short passive	5.176	4.110	6.519
Active	Long passive	45.202	35.850	56.994
Short passive	Long passive	8.733	6.398	11.919

Table 58.　　　　Actives versus passives, short and long.

When we include in the model the type of sentence (active and short passive) and the age, there are differences both by sentence type and by age (except for 6-year-olds and adults). As expected the major differences exist when the difference in age is greater as it is the case between 3 and 6 or between 3 and adults, OR= 0.026, CI $_{95\%}$= (0.010, 0.63) and OR= 0.037, CI $_{95\%}$= (0.018, 0.076), respectively. See Table 59.

Age in years	Age in years	Odds Ratio	Lower Odds Ratio	Upper Odds Ratio
3	4	**0.378**	**0.227**	**0.629**
3	5	**0.192**	**0.114**	**0.322**
3	6	**0.026**	**0.010**	**0.063**
3	Adult	**0.037**	**0.018**	**0.076**
4	5	**0.508**	**0.294**	**0.878**
4	6	**0.068**	**0.027**	**0.170**
4	Adult	**0.099**	**0.048**	**0.206**
5	6	**0.134**	**0.053**	**0.336**
5	Adult	**0.195**	**0.093**	**0.407**
6	Adult	1.453	0.514	4.112

Table 59.　　　　Actives and short passives by age in years.

If, furthermore, we consider that there may be different effects from age according to each type of sentence (within actives and within passives), then we obtain the following (in this case we do not include the results for adults). See table 60.

Label	OR Estimate	Lower OR	Upper OR
active versus passive	5.1386	3.4479	7.6583
active versus passive at three years	3.5089	2.5639	4.8022
active versus passive at four years	6.4045	4.2260	9.7059
active versus passive at five years	8.6881	5.0623	14.9108
active versus passive at six years	15.3527	3.3803	69.7288

Table 60.　　　Effects from age according to each type of sentence (actives vs. short passives).

As can be seen in Table 61 there are statistical significant differences among all age groups except for 6-year-olds and adults, where the odds ratio is 0.939. Again, the main differences can be seen when we compare the odds ratio of 3 and 6 or 3 and adults, and this is because 6-year-olds and adults performed almost perfectly whereas 3-year-old had great difficulties in comprehension.

Age in years	Age in years	Odds Ratio	Lower Odds Ratio	Upper Odds Ratio
3	4	**0.347**	**0.198**	**0.609**
3	5	**0.303**	**0.178**	**0.515**
3	6	**0.008**	**0.004**	**0.018**
3	Adult	**0.007**	**0.003**	**0.017**
4	5	0.871	0.499	1.521
4	6	**0.023**	**0.010**	**0.051**
4	Adult	**0.022**	**0.010**	**0.048**
5	6	**0.026**	**0.012**	**0.058**
5	Adult	**0.025**	**0.011**	**0.054**
6	Adult	0.939	0.356	2.474

Table 61.　　　Actives versus long passives.

If, furthermore, we consider that there may be different effects from age according to each type of sentence (actives vs. long passives), in this case it should be noted that there are bigger differences between actives and long passives than between actives and short passives. The results we obtain are the following (in this case we do not include the results for adults). See table 62.

	OR		
Label	Estimate	Lower OR	Upper OR
active versus passive	24.2431	16.4536	35.7202
active versus passive at three	24.0288	17.0261	33.9118
active versus passive at four	42.7870	27.1886	67.3342
active versus passive at five	159.52	98.4127	258.58
active versus passive at six	38.6492	8.8929	167.97

Table 62.   Effects from age according to sentence type.

As in the previous section, there are differences between actives and all passives. As far as age is concerned, 4 and 5 years old's results are not different from each other and neither are six-year-olds' results different from adults'. See Table 64.

acti	_acti	Odds Ratio	Lower Odds Ratio	Upper Odds Ratio
active	passive	19.251	16.245	22.812

Table 63.   Actives versus passives.

Age in years	Age in years	Odds Ratio	Lower Odds Ratio	Upper Odds Ratio
3	4	**0.390**	**0.215**	**0.707**
3	5	**0.364**	**0.207**	**0.640**
3	6	**0.017**	**0.008**	**0.034**
3	Adult	**0.011**	**0.005**	**0.023**
4	5	0.933	0.524	1.663
4	6	**0.044**	**0.021**	**0.089**
4	Adult	**0.028**	**0.013**	**0.058**
5	6	**0.047**	**0.023**	**0.093**
5	Adult	**0.030**	**0.014**	**0.061**

Age in years	Age in years	Odds Ratio	Lower Odds Ratio	Upper Odds Ratio
6	Adult	0.633	0.274	1.464

Table 64. Actives and short passives + long passives with age in years.

If, furthermore, we consider sentence type by age, the results are as in Table 65 (in this case we do not include the results for adults).

Label	OR estimate	Lower OR	Upper OR
active versus passive at three	9.7243	7.6443	12.3703
active versus passive at four	19.1420	13.6514	26.8410
active versus passive at five	91.4346	58.7754	142.24
active versus passive at six	39.0833	9.1314	167.28

Table 65. Effects from age according to each type of sentence.

Finally we compare performance for long and short passives in Table 66. The odds of obtaining a correct answer for a short passive is 6 times higher than that for a long passive.

Type	Type	Odds Ratio	Lower Odds Ratio	Upper Odds Ratio
Short passive	Long passive	6.094	3.950	9.402

Table 66. Short passives and long passives.

In Table 67, what stands out in these results is that the 6-year-olds present statistically significant differences with all other groups except adults; no differences were found between 4 and 5-year-olds.

Age in years	Age in years	Odds Ratio	Lower Odds Ratio	Upper Odds Ratio
3	4	0.502	**0.274**	**0.919**
3	5	0.495	**0.277**	**0.882**
3	6	0.020	**0.010**	**0.042**
3	Adult	0.007	**0.003**	**0.017**

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Age in years	Age in years	Odds Ratio	Lower Odds Ratio	Upper Odds Ratio
4	5	0.985	0.545	1.781
4	6	0.041	**0.020**	**0.084**
4	Adult	0.014	**0.006**	**0.033**
5	6	0.041	**0.021**	**0.084**
5	Adult	0.014	**0.006**	**0.033**
6	Adult	0.349	**0.137**	**0.887**

Table 67.   Short passives and long passives with age in years.

If, furthermore, we consider that there may be different effects depending on sentence type (short passives vs. long passives), in this case we observe that at 6 there are no differences between short passives and long passives; for all other ages, there are differences between the two sentence types. The results we obtain appear in Table 68 (in this case we do not include the results for adults).

Label	OR estimate	Lower OR	Upper OR
Short Passive versus long at three	5.1954	2.3176	11.6465
Short Passive versus long at four	5.8775	2.5278	13.6664
Short passive versus long at five	22.9259	10.227	51.3884
Short passive versus long at six	**1.6806**	**0.5538**	**5.1000**

Table 68.   Effects from age according to sentence type.

5.4.   Discussion

According to the data gathered in the developmental study in experiment 1 several conclusions can be drawn.

First and foremost, children do not comprehend long passives of actional verbs in Catalan until they are at least 6 years of age. This is in accordance with the hypothesis put forward by Wexler. Interestingly, there is a sudden increase in understanding long passives at 6, and before that age performance is indistinguishable. Before the age of 6, that is from 3 to 5, they interpret long passives as actives, that is, they reverse the roles of Agent and Patient. When they hear '*The*

little boy is hugged by Grandpa', they understand '*The little boy hugs or is hugging Grandpa*' and this is reflected in their answers.

Secondly, actives are well understood by Catalan children at the different ages tested. This was an expected result.

Thirdly, short passives are better understood than long passives. The reason for this could be that children give an adjectival interpretation to short passive, since, in Peninsular Catalan, the past participle is generally homophonous with an adjective. This is an explanation put forward by Borer and Wexler (1987) which is further explored in experiment 3.

Lastly, the absence of a by-phrase does not seem to help understand the short passive, contrary to what Fox and Grodzinsky predict in their hypothesis.

On their part, and as it was noted in the background chapter, O'Brien, Grolla, and Lillo-Martin (2006) report that three-year-old children succeed in their comprehension of English passives, even with non-actional verbs, provided the test satisfies felicity conditions, that is an alternative agent/experiencer. They argue that a *by*-phrase makes sense when there are competing agents/experiencers. Their idea is that the comprehension of long passive sentences increases when the discourse or sentence being tested includes multiple candidates for the role of agent/experiencer. In their test they found that when there was no extra agent/experiencer children failed, but they succeeded when the felicity condition was met. Even though our experiment differs from theirs, it is true that there are three competing agents clearly depicted in the pictures where two of them are false under an adult reading. Therefore we can say that in a task like ours children fail to choose the correct agent despite having three different agents to choose from. This argues against O'Brien et al.'s claim that felicity conditions increase the performance of comprehension; in our case, their claim is not sustained.

Therefore, as found for other languages our study on the interpretation of actional passives in Peninsular Catalan demonstrates delay in the acquisition of passives when compared to actives. Under a standard assumption that 75% correct answers indicate an adult-like grammar, children know actives at the earliest stage, and short passives only at 5. Five-year-olds still perform quite badly in long passives. Not until they are 6 do they understand long passives fully.

The presence of the *by*-phrase is of obvious importance for the acquisition of passives. Children did not perform well at long actional passive sentences and it is clear that there is a substantial difference in the results when we compare the children's performance at short and long passive sentences. Still, contra the claims of Fox and Grodzinsky, short passives were not understood as early as actives. The different behaviour of children with respect to long and short passives, the latter having a possible adjectival reading, argues in favour of Wexler (2004) who associates late appearance of verbal passives with the late maturation of defective phases. Between these two competing explanations, Wexler's theory seems best to account for our results. A further prediction of Wexler's account is that passives should cease to be problematic after age 5, as a result of maturation. In our study we have shown that Catalan children acquire passives later than 5. Passives are comprehended between 6 and 7.

In languages where adjectival passives are not homophonous with verbal passives the prediction is that children will be delayed acquiring all passives, not just non-actional ones. We know that in Greek (Terzi and Wexler 2002) and Hebrew (Berman 1985) where there is no such homophony children are delayed on all verbal passives. This seems to be the case in Catalan, too.

It is relevant to report the results of the only other study on the acquisition of passives in Catalan, by Cunill (2012). Cunill analyzed the comprehension of Catalan actives and long and short passives of actional and non-actional/psychological verbs by 78 monolingual 3-to-7-year-old children. The materials used in the experiment were based on Maratsos *et al*. (1985) and Hirsch and Wexler (2006c). Four actional verbs (*push, wash, kiss, hold*) and four non-actional/psychological verbs (*remember, hate, love, see*) were used in the experiment. The results show that actives of both actional and non-actional/psychological verbs are well understood, with the 4-year-old group at ceiling. 5-year-olds do interpret short actional passives, and long actional passives are comprehended by the group of children whose ages range from 6; 4 to 7; 2. Non-actional/psychological short and long passives are only comprehended by the oldest age group. See Table 69.

Groups	Actional Active	Actional Short Passive	Actional Long Passive	Psychological Active	Psychological Short Passive	Psychological Long Passive
Group 1 (3;10)	74.2	49.2	50	71.7	42.5	48.3
Group 2 (4;10)	90.8	66.7	41.7	95	36.7	37.5
Group 3 (5;10)	97.8	75	47.1	98.5	36.8	39.7
Group 4 (6;9)	98.4	88.3	75.8	99.2	61.7	47.7
Group 5 (7;7)	99.2	99.2	95.8	99.2	83.3	74.2

Table 69.   Percentage correct, Cunill (2012).

If I compare Cunill's results to mine, there are some differences especially in the long passives. The 3-year-old group in Cunill's experiment got a 50% correct answer rate and in my experiment it was a mere 23.40%. As for the 5-year-old group in Cunill's experiment, they got a 47.1% correct answer rate whereas in mine only got a 29.49%. In any event, in all these results the children were not above chance. As for 6-year-olds, they performed better in my experiment (91.82%, to be compared to 75.8% in Cunill's). However, these differences are not dramatic. The overall results in actional passives are quite similar in both experiments. As for the psychological passives tested in Cunill's experiment we can note that short psychological passives are understood more poorly than short actional passives. Both short and long psychological passive are not understood at age six. The age issue is discussed again in section 7.6.

Cunill attributes the difference in performance between actional and psychological passives to the combination of the passive construction and the argument structure of the verb, Experiencer-Theme verbs being more difficult than Agent-Theme verbs.

Chapter 6. Experiment 2: Majorcan Catalan

6.1.   Balearic Catalan

The Catalan spoken in the Balearic Islands differs in a relevant respect from the Catalan spoken in Catalonia. It must be noted that many languages have different prepositions in passives and agentive nominals. Peninsular Catalan is one such language. In Balearic Catalan the same preposition is used in both passives and agentive nominals, the preposition that introduces the agent in the passive construction is *de* 'of', which is also used in nominals to express authorship or possession (131). Specifically, this is particularly robust in Menorca.

(131)   el llibre d'en Pla

           the book PREP ART Pla

           'the book by Pla.' or 'Pla's book.'

As we have seen, Fox and Grodzinsky (1998) argued that English-speaking children's trouble with passives has nothing to do with the difference between verbal and adjectival participles but rather reflects an inability to use the *by*-phrase to transmit the verb's implicit argument. Because the preposition *by* introduced agents in the non-truncated passive, Fox and Grodzinsky considered that children could understand well long passives of actional verbs, however, they could not understand long passives of non-actional verbs since there was a mismatch between the thematic role assigned by the preposition *by* (Agent) and that of non-actional passives

(Experiencer). As a result, the preposition *by* helped children understand actional passives and in turn also made children fail to comprehend non-actionals.

In Peninsular Catalan we cannot corroborate these predictions because the preposition *per/pel/pels* ('by') does not assign the thematic role of an agent, but in Balearic Catalan this is possible. As stated above, the preposition *de* is used as a nominal agent (131) and to introduce an agent (132) in the passive (example taken from Wheeler *et al.* 1999: S 29.1.2).

(132)   Aquest diari és llegit de molta gent.

this newspaper is read of many people

'This newspaper is read by lots of people.'

Also Nicolau Dols from the Universitat de les Illes Balears (personal communication) confirmed this usage of the preposition *de*. This constitutes an excellent opportunity to verify whether Fox and Grodzinsky's proposal really held. Consequently an experiment was designed to test the predictions of Fox and Grodzinsky's hypothesis applied to Balearic Catalan, namely that because Balearic Catalan had a preposition *de* that can introduce an agent theta role, the long passive of actional verbs could be more easily understood and as a result children would understand it better than in the case of Peninsular Catalan, where the preposition *per* does not assign an agent theta role except for the passive.

6.2.   Experimental design

Task, materials and procedure are the same as Experiment 1. The only change were, obviously, the sentences, because they were produced in Balearic Catalan, and also the absence of short passives, which were not tested. The sentences were recorded by a native speaker of Majorcan Catalan, Maria del Mar Vanrell. See figure 9 for the materials.
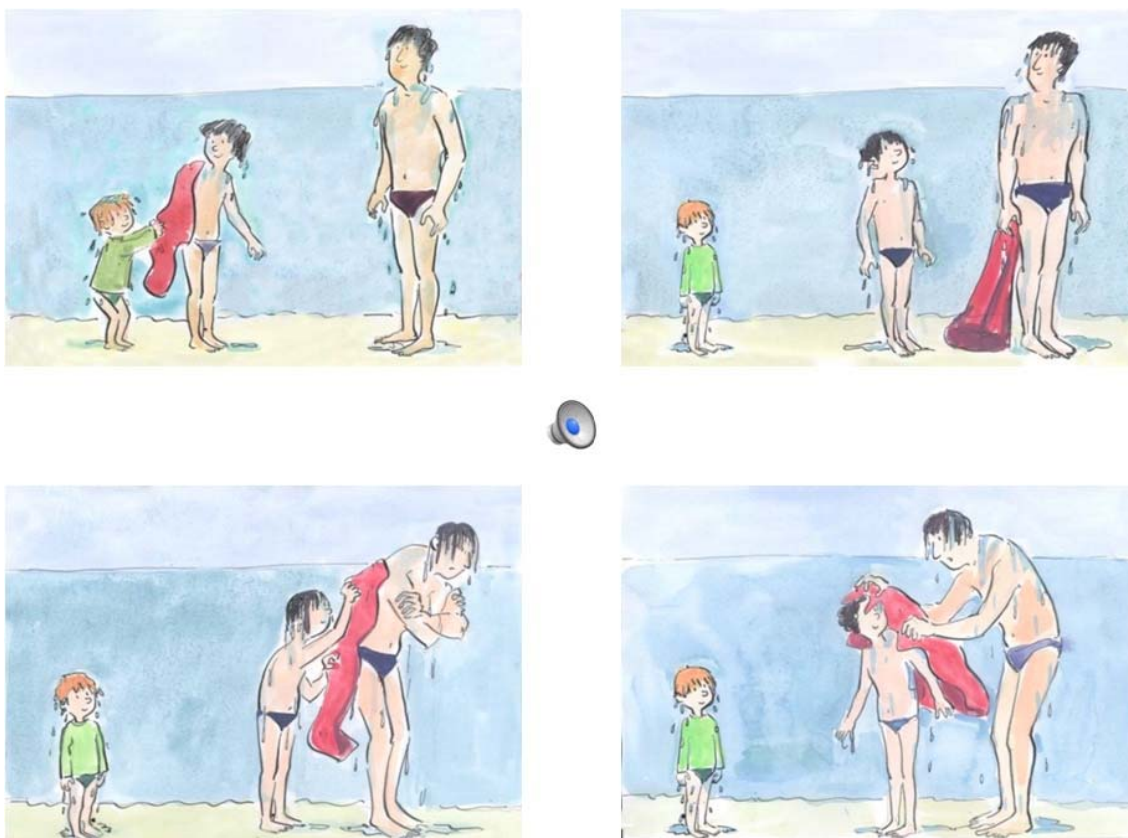
Figure 9.   Es nin gran és eixugat de son pare. 'The big brother is dried by Papa'

The test comprised 22 sentences with male characters and 22 sentences with female characters, of which in each part there were 11 questions in the active and its 11 long passive counterparts, exemplified in (133) and (134) respectively.

(133)   Es nin gran eixuga a son pare.

           The brother big dries to his father

           'The big brother dries his father. '

(134)   Es nin gran és eixugat de son pare.

           The brother big is dried by his papa.

           'The big brother is dried by Papa.'

Sentences were presented in random order. A complete list of the items used can be found in Appendix D.

6.2.1. Predictions

In accordance with Wexler's UPR, long passives should get poor results because of the difficulty of children with defective phases. Also, the older the children, the better the results should be, since according to this hypothesis phases are subject to maturation. Results are expected to be as bad as in Peninsular Catalan.

On the other hand, if Fox and Grodzinsky were right, then children wouldn't have any problem understanding long passive sentences because the preposition, in this case *de* (by), can be used to introduce agent nominals, with the theta-role which would coincide with the agent introduced by the *by*-phrase in passive sentences. Results would therefore be expected to be better in Balearic Catalan than in Peninsular Catalan.

6.2.2. Subjects

A total number of 51 children, aged 4, 5, and 6, all native speakers of Majorcan Catalan, were tested in Palma de Mallorca. The 51 children were tested on their comprehension of active sentences and on their comprehension of non-truncated (long) passives. Details of the subjects appear in Table 70.

Age group	N	Mean age	Age range
4-year-olds	5	4;6	4;2–4;11
5-year-olds	17	5;6	5;1–5;11
6-year-olds	29	6;7	6;1–6;11
total	51	5;6	4;2–6;11

Table 70. Distribution of the different age groups.

As for age, we have two categorizations in years: years young and years older, where young is up to and including 6 months and older is from 7 months up to and including 11 months. Differentiating between young and old within a year the distribution is as shown in Table 71.

Actional Passives in Child Catalan

Age groups	N
4 Young	2
4 Older	3
5 Young	7
5 Older	10
6 Young	10
6 Older	19

Table 71.   Distribution of the split age groups.

All of the children were acquiring Majorcan Catalan as their first language and spoke Majorcan Catalan at home at least to one parent.

6.2.3.   Statistical methods

We used the Generalised Linear Model and the Logistic Regression Model. All the results were obtained with SAS software 9.2 version (SAS System, Cary, NC, USA, 2009) and were performed by the Servei d'Estadística Aplicada of the UAB.

6.3.   Results

The results with actives are clearly indicative of above-chance performance (children are given a four-picture choice); long passives, in contrast, were poorly understood. See Table 72 for the results. (These results have been reported in Gavarró, Parramon and Rallo 2013.)

	4-year- olds	5-year-olds	6-year-olds
active	63.6%	79.7%	90.4%
long passive	26.5%	25.4%	58%

Table 72.   Percentage of correct answers, actives vs. passives.

Next we present the tables of the descriptive statistics for the global percentage of correct answers according to age, including active and passive sentences. In Tables 73 and 74 we can see that the older the children, the more correct sentences they have answered. In Table 74 children are grouped in 6-month groups.

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Age years	N	Mean	Std Dev
4	5	19.80	6.06
5	17	22.47	4.17
6	29	32.66	6.61

Table 73.　　　　Number of correct answers over 44 according to whole age groups.

Age groups	N	Mean	Std Dev
4 Young		25.50	0.71
4 Older	3	16.00	4.36
5 Young	7	23.43	3.82
5 Older	10	21.80	4.47
6 Young	10	29.30	5.42
6 Older	19	34.42	6.62

Table 74.　　　　Number of correct answers over 44 according to split age groups.

See Table 75 for the results of active sentences.

Age years	N	Mean	Std Dev
4	5	63.64	25.91
5	17	79.68	15.09
6	29	90.44	6.24

Table 75.　　　　Percentage of correct answers for active sentences according to whole age

groups.

In figure 10 we can see that the older the children, the more correct answers they give.
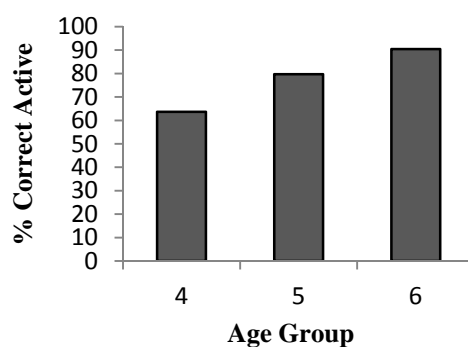
Figure 10.　　　　Percentage of correct answers for active sentences according to age.

If we differentiate between young and older groups, the results are as shown in Table 76.

Age group	N	Mean	Std Dev
4 Young	2	81.82	6.43
4 Older	3	51.52	27.77
5 Young	7	83.12	21.60
5 Older	10	77.27	8.83
6 Young	10	89.09	9.14
6 Older	19	91.15	4.14

Table 76.   Percentage of correct answers for active sentences according to split age groups.

As we can see in Figure 11 when we split the age groups in young and old, we can see that the 4-and the 5-year-old young groups perform better than their older counterparts (although this difference need not reach significance), while the 6-year-old young group and the 6-year-old older group perform equally well.
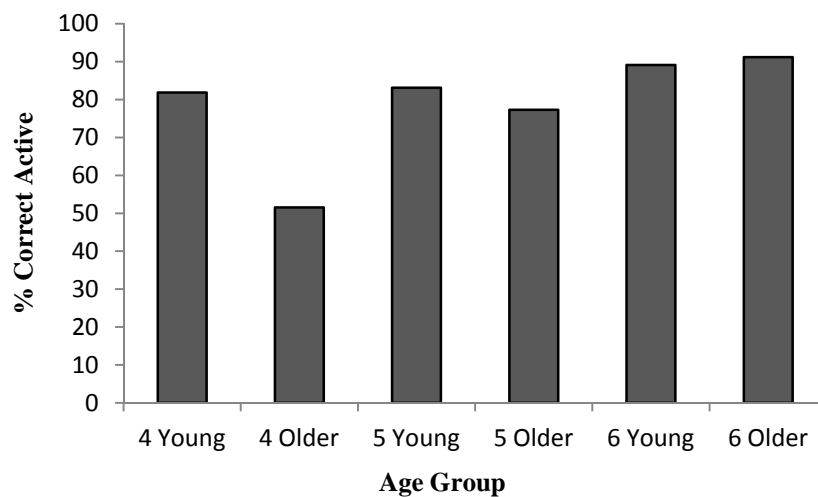
Figure 11.   Percentage of correct answers for active sentences (split age groups).

For long passive sentences again 6-year-olds performed better than 4-and 5-years-olds, and the performance of these two groups is similar. See Table 77.

Age years N		Mean	Std Dev
4	5	26.54	9.68
5	17	25.43	11.10
6	29	57.99	27.05

Table 77. Percentage of correct answers of long passive sentences by age group.

In Figure 12 we can see that the 4- and the 5-year-old groups perform equally well.
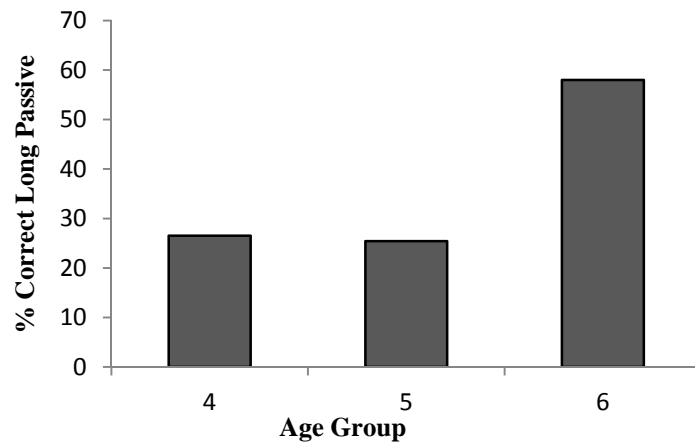
Figure 12. Percentage of correct answers for long passive sentences (whole age groups).

If we differentiate between young and older, the results are shown in Table 78.

Age groups N		Mean	Std Dev
4 Young	2	34.09	3.21
4 Older	3	21.50	9.34
5 Young	7	23.44	12.35
5 Older	10	26.82	10.60
6 Young	10	44.09	21.00
6 Older	19	65.31	27.45

Table 78. Percentage of correct answers for long passive sentences according to split age groups.

As can be seen graphically in Figure 13 there is hardly any progress until age 6.
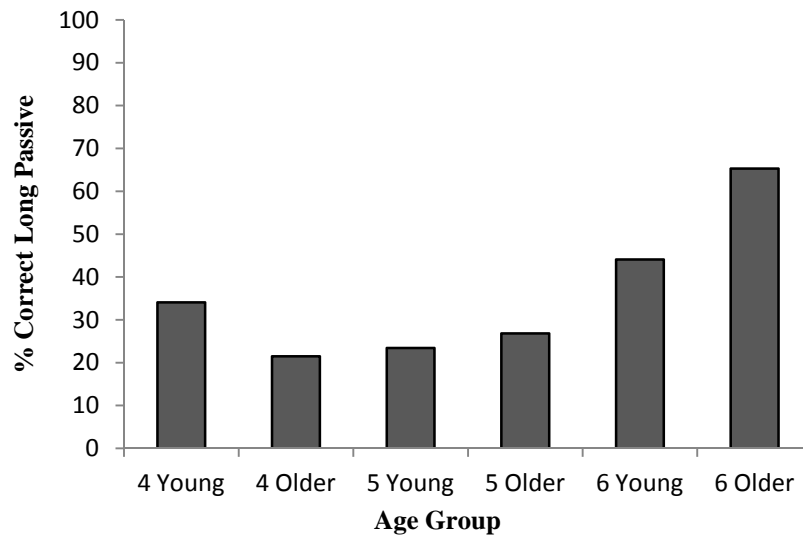
Figure 13.   Percentage of correct answers for long passive sentences according to split age groups.

In the analysis by sentence type very significant statistical differences between the active and the passive sentences were found. The quantification of this difference can be found in the odds ratio statistic which expresses how high the odds of obtaining a correct answer for an active sentence are compared to those of a passive sentence. As can be seen in Table 79, we find that the odds of obtaining a correct answer in an active sentence are 9 times higher than those for a passive sentence. Therefore, regarding the performance of the children, the effect of type of sentence was statistically significant: actives were understood better than long passives (OR = 8.857, CI $_{95\%}$ =(7.106, 11.041)).

Type	Type	Odds Ratio	Lower Odds Ratio	Upper Odds Ratio
active	passive	**8.857**	**7.106**	**11.041**

Table 79.   Actives vs. Passives.

In the results for age there are statistically significant differences of the 6-year-old group with respect to the other two groups. 4-year-old children had a poorer comprehension of the active and passive sentences when compared to 6-year-olds (OR = 0.180, CI$_{95\%}$=(0.083, 0.392)), and 5 yearold children also had a poorer comprehension of the active and passive sentences when compared to 6-year-olds (OR = 0.271, CI$_{95\%}$=

(0.165, 0.445)).We did not obtain statistically significant differences between the 4-and 5-year-old groups. See Table 80.

age	_age	Odds Ratio	Lower Odds Ratio	Upper Odds Ratio
4	5	0.664	0.295	1.494
4	6	**0.180**	**0.083**	**0.392**
5	6	**0.271**	**0.165**	**0.445**

Table 80. Actives vs. passives and age.

For actives there are statistically significant differences among all the groups, although the biggest are between the 4- and 6-year-old groups: (OR = 0.188, $CI_{95\%} = (0.087, 0.407)$). The odds of giving a correct answer for the four-year-old children is almost half the odds of the 5-year-olds. Finally, the odds of giving a correct sentence of the five-year-old children is almost half the odds of the 6–year-olds. See Table 81.

age	_age	Odds Ratio	Lower Odds Ratio	Upper Odds Ratio
4	5	**0.439**	**0.198**	**0.974**
4	6	**0.188**	**0.087**	**0.407**
5	6	**0.428**	**0.251**	**0.731**

Table 81. Active sentences and age.

For long passives there are no statistically significant differences between 4- and 5-year-olds, but there are between 4- and 6-year-olds, (OR = 0.235, $CI_{95\%}= (0.086, 0.645)$), and 5- and 6-year-olds, (OR = 0.291, $CI_{95\%}= (0.115, 0.415)$). See Table 82.

age	_age	Odds Ratio	Lower Odds Ratio	Upper Odds Ratio
4	5	1.073	0.370	3.112
4	6	**0.235**	**0.086**	**0.645**
5	6	**0.219**	**0.115**	**0.415**

Table 82. Long passive sentences and age.

6.4. Comparisons between Majorcan and Peninsular Catalan

In this section we compare the results of Balearic Catalan and Peninsular Catalan. It should be noted that the Peninsular Catalan sample included adults and 3-year-olds. Neither of these age groups was tested in Balearic Catalan. The results in percentages for the two varieties appear in Table 83.

	3-year- olds Peninsular/Balearic		4-year-olds Peninsular/Balearic		5-year-olds Peninsular/Balearic		6-year-olds Peninsular/Balearic	
active	83.9	-	94	63.6	97.5	79.7	98.8	90.4
long passive	20	-	37.8	26.5	31	25.4	95.4	58

Table 83. Percentage of results. Actives vs. long passives Peninsular Catalan/ Balearic Catalan.

For actives, the Peninsular Catalan children perform significantly better: the odds of obtaining a correct answer for Peninsular Catalan children in an active sentence is 3 times higher than those for Balearic Catalan children. So, regarding the performance of children, actives were understood better in Peninsular Catalan than in Balearic Catalan (OR = 3.243, $CI_{95\%}$= (2.179, 4.826)). See Table 84.

Language	Language	Odds Ratio	Lower Odds Ratio	Upper Odds Ratio
Peninsular Catalan	Balearic Catalan	**3.243**	**2.179**	**4.826**

Table 84. Differences between Catalan and Majorcan actives.

If we take out the 3-year-old Peninsular Catalan children (we must remember that in the Majorcan sample there are no children of this age), then the differences increase even more in favour of Peninsular Catalan children, this time the odds of giving a correct answer for Peninsular Catalan children being nearly 6 times higher than that for Majorcan children (OR = 5.776, $CI_{95\%}$= (3.885, 8.588)). See Table 85.

Language	Language	Odds Ratio	Lower Odds Ratio	Upper Odds Ratio
Peninsular Catalan	Balearic Catalan	**5.776**	**3.885**	**8.588**

Table 85.　　　Differences between Catalan and Majorcan actives without the 3-year-old group.

For long passives we did not obtain statistically significant differences between the two language varieties. However, if we take out the 3-year-old Peninsular Catalan children (we must remember that in the Majorcan sample there are no children of this age), we obtain statistically significant differences between the two varieties: the Peninsular Catalan children have higher odds of giving a correct answer (OR = 1.905, $CI_{95\%}$= (1.055, 3.441)). See Table 86.

Language	Language	Odds Ratio	Lower Odds Ratio	Upper Odds Ratio
Peninsular Catalan	Balearic Catalan	**1.905**	**1.055**	**3.441**

Table 86.　　　Differences between Catalan and Majorcan long passives without the 3-year-old group.

6.5. Discussion

Actives are well understood by both Peninsular Catalan and Balearic children, but long passives are poorly understood by both groups of children, especially the Balearic Catalan group. There are statistical differences between the two groups (Balearic Catalan vs. Peninsular Catalan), with the Peninsular Catalan-speaking children performing better on both actives (OR=5.776) and passives (OR=1.905).This may have been influenced by the size of the sample, which was smaller for Balearic Catalan.

Our results are not in accordance with the predictions of Fox and Grodzinsky's hypothesis. In Balearic Catalan the prediction was that children would understand well long passives of actional verbs because, despite the lack of theta-transmission in children, the preposition *de*, just like *by* in English, would assign an Agent theta-role to its complement. Our results do not support this prediction: Balearic Catalan children

fail with long passives, and their performance is even worse than that of Peninsular Catalan children. Long passives of actional verbs are not interpreted in an adult-like manner by children when the preposition introduces an agent theta-role. Therefore, the Theta Transmission Hypothesis put forward by Fox and Grodzinsky (1998) is not supported by the results obtained in Balearic Catalan.

Furthermore, there are at least three reasons to question Fox and Grodzinsky's hypothesis. First, their results have not been replicated. Second, the small number of subjects and items in their experiment raises the possibility of that a statistical artifact plays a role in their result. Third, the methodology employed in their study leads to a clear possibility of artifact. The experiment was run over four separate sessions, with no control over what the children learned or were taught between each session, nor for any inherent maturation between sessions.

On the other hand, the results seem to fit the hypothesis by Wexler in that the passive voice is a late acquisition, as this is true both in Peninsular and Balearic Catalan.

Chapter 7. Experiment 3: Adjectival passives

7.1.   Introduction to adjectival passives

The relationship between verbal and adjectival passives has been very important in the debate on language acquisition (and adult grammar), and the general idea has been that adjectival participles regularly precede verbal participles in development. Borer and Wexler (1987) relied on the results from elicited production tasks (e.g., Horgan 1978) and experimental studies of comprehension (Maratsos et al. 1985; Sudhalter and Braine 1985), that showed that pre-school children do use passive participles but they almost never produce non-truncated passives with a *by*-phrase and, if the participle does not denote a resultant state, they find it difficult to understand passives. As stated in the background, Borer and Wexler (1987) and Wexler (2004) proposed that some syntactic principles undergo a process of maturation and may not be operative until children are older. In the case of the passive, they suggest that young children can derive adjectival participles, but that until the age of five years (or later) they do not have command of certain syntactic operations – A-movement in the case of Borer and Wexler (1987) and defective phases in the case of Wexler (2004).

In the third experiment we wanted to verify if the children resort to an adjectival interpretation to understand the passive. As it was said in the background chapter, there is a delay in the acquisition of passives in certain languages that lack s-homophones whereas in the opposite case, that is, when the past participle can work as an adjective (s-homophone) this may help the child understand the passive.

For a sentence like (135):

(135)   The door was closed

the ambiguity can be resolved as in (136).

(136)   a. The door was not open. (closed: adjective)
           b. Someone closed the door. (closed: verb)

For the reading represented in (136a), the sentence in (135) is base-generated. That is, the word *closed* is derived as an adjective. For the reading in (136b), sentence (135) is transformationally derived. To put the points differently, adjectival passives are lexically derived and exhibit stative properties, while verbal passives are derived by a rule at the sentence level operation and exhibit eventive properties. This was first distinguished by Wasow (1977).

On his part, Embick's (2004) analysis of adjectival passives distinguishes stative passives:

(137)   The door is open.

from resultative passives:

(138)   The tank is filled.

Resultative passives involve an event, whereas the stative passives do not. For example, in (139)

(139)   The door was opened.

the sentence could have the reading of an eventive passive 'someone opened the door' or the reading of a resultative 'the door was in a state of having become open'.

The meaning of the resultative passive is that the door has entered a target state that resulted from an event of opening.

A number of diagnostics distinguish between statives and resultatives. One involves adverbial modification. Unlike pure statives, resultatives allow modification by manner (and other) adverbials (140-141).

(140)　　a. The package remained carefully opened.

　　　　　b.*The package remained carefully open.

(141)　　a. the carefully opened package

　　　　　b.*the carefully open package

Embick's analysis of the stative/resultative difference rests on a verbalizing *v* head in the resultative, but not in the stative. The presence of this head, which is associated with verbalization and eventivity, is related to the differences in adverbial modification (Travis 1994, Harley 1995).

A second syntactic diagnostic differentiating stative from resultative participles has to do with the ability or inability to serve as resultative secondary predicates like *flat* in examples such as those in (142-144), due to Embick (2004).

(142)　　John hammered the metal flat.

(143)　　John kicked the door closed.

(144)　　John kicked the door open/*opened.

A third diagnostic involves prefixation with *un-,* which is generally quite limited with statives, but applies more or less freely with resultatives.

(145)　　*un-rott-en, unrott-ed

　　　　　*un-bless-èd, un-bless-ed

　　　　　*un-shrunk-en, un-shrunk

There are some statives that allow *un-,* such as *un-shav-en,* or *un-happy.* Nevertheless, the general pattern is that *un*-prefixation is fully productive with resultatives, but not with statives.

Stative verbs and adjectival passives in English resist *by*-phrases,

(146)   The fact was unknown (*by Peter).

although sometimes they take a *by*-phrase (see Weinberg 1987, and Pinker *et al.* 1987, from where the examples have been taken).

(147)   This island is uninhabited by humans.

(148)   John remained feared by all.

(149)   The child was unwanted by his parents.

This is, therefore, not a foolproof diagnostic of the verbal/adjectival distinction. Adjectival passives do not contain an implicit intervening external argument. Verbal passives (150) allow purpose clauses, but pure adjectives (152) and statives (153) do not appear to license purpose clauses.

(150)   The boat was sunk PRO to collect the insurance.

(151)   *The boat was unsunken to collect the insurance

(152)   *The ruler is long to measure things.

(153)   *The toy is broken to prove a point.

Grimshaw (1990) and Pesetsky (1995) both focus on progressive aspect as a test for verbal versus adjectival passives. Verbal passives freely take progressive aspect (156), while adjectives do not (154)-(155):

(154)   *John is being happy.

(155)   *John is being unkicked.

(156)   John is being kicked.

In what follows we consider in detail two papers that address the adjectival reading of passives by children.

7.2. Russian passives

In their study of the acquisition of perfective and imperfective passive constructions in Russian, Babyonyshev and Brun (2004) found an asymmetry in the acquisition of imperfective and perfective passives.

Russian has two types of passive constructions: verbal passives (157) and adjectival passives (158). The verbal passive construction can be derived from either imperfective or perfective verbs. Imperfective verb forms denote events without an end point, i.e. atelic events (157a), while perfective events denote events with an end point, i.e. telic events (157b):

(157) a. Dom strouilsya   (Vanej)   dva goda/*za dva goda.

House build IMP-PASS (Vanya-INSTR) two years/ in two years

'The house was being built   (by Vanya) for two years/ *in two years.'

b.   Dom byl postroen   (Vanej)   za dva goda/ *dva goda.

House was build-PERF-PASS (Vanya-INSTR) in two years/ two years

'The house has been built (by Vanya) in two years/*for two years.'

(158) a. Kofta byla vyazanaja   (*mamoj).

Cardigan was knitted-LF-FEM-NOM (mama-INST)

'The cardigan was knitted (*by mom).'

b.   Kofta byla svyazana   (*mamoj).

Cardigan was knitted-SF-FEM (mama: INST)

'The cardigan was knitted (*by mom).'

It is important to highlight two properties of the adjectival passive constructions. First, the phonological realization of the short passive in (158b) is identical to the perfective verbal passive in (157b). They are s-homophones, that is, they have distinct structure but common pronunciation. Second, the adjectival passive is unable to co-occur with the *by*-phrase.

Both perfective and imperfective verbal passives are unaccusative predicates. They pass standard tests for unaccusativity like the genitive of negation test or the conjunct agreement test. Verbal passives participate in the genitive of negation construction where the nominal argument of a negated unaccusative predicate can surface with genitive case marking (Pesetsky 1982; Bailyn 1995; Babyonyshev 1996; Brown 1999; Babyonyshev and Brun 2004.):

(159) a. V etom poselke ne bylo postroeno   nikakix novyxdomov.

     in this town NEG was build_PERF-PASS no-kind new houses-

     GEN

     'No new houses of any kind were built in this town.'

  b. V etom poselke ne stroilos   nikakix novyx domov.

     in this town NEG build-IMP-PASS no-kind new houses-GEN

     'No new houses of any kind were being built in this town.'

  c. *V klasse ne svistelo nihakix detej.

     in class NEG whistled no-kind children-GEN

     'No children whistled in class.'

Thus, the genitive of negation is possible for both the perfective and imperfective passive constructions (160a-b) but not for the unergative predicate in (160c).

As for the conjunction agreement, when the conjoined subject occurs in the postverbal position, the verb can show singular agreement triggered by the first conjunct (Babyonyshev 1996). Only the plural agreement counterpart is possible in the case of an unergative predicate.

(160)   a.   V poselke byli postroeny/byl postroen/*byla postroena

in town   were built-PERF-PASS-PL/MASC-SG/*FEM-SG

dom   i skola.

house-MASC and school-FEM

'A house and a school were built in town.'

b.   V poselke stroilis'/stroilsya/*strolilas'

in town built-IMP-PASS-PL/MASC-SG/*FEM-SG

dom   i skola.

house-MASC and school-FEM

'A house and a school were being built in town.'

c.   V klasse svisteli/*svistel/*svistela devocka   I   mal'cik.

In class whistled-PL/MASC-SG/FEM-SG girl-FEM and boy-MASC

'A girl and a boy whistled in class.'

Likewise, in the examples with perfective and imperfective passives (157a-b), the verb can either be in plural form or agree with the first member of the conjunct but not with the second member. Since verbal passives are unaccusative constructions, their representation involves a (subject; object) A-chain in adult grammars.

As for adjectival passives and following Wasow (1977), Williams (1981), and Levin and Rappaport (1995) the authors assume that these constructions are unergatives. Adjectival passives constructions pattern with unergative verbs in not allowing genitive case to surface on their nominal arguments under negation.

(161)   a.   Ni odin mal'cij   ne ostalsya   nepricesan.

not one boy-NOM NEG remained-MASC-SG uncombed-MASC-SG

'Not a single boy remained uncombed.'

b.   *Ni odnogo mal'cika   ne ostalos'   nepricesano.

not one   boy-GEN   NEG remained-NEUT-SG uncombed-

NEUT-SG

'Not a single boy remained uncombed.'

As a conclusion we can state that these constructions are unergative and do not require a (subject, object) A-chain in their representation.

Because with the perfective passives children under the age of five would be able to use an unergative s-homophone, the adjectival passive, which does not require the formation of (subject, object) A-chains, the authors predict that children will produce more perfective passives than imperfective passive forms.

They conducted an analysis of the spontaneous speech of 8 monolingual children between ages 2; 6 and 3; 9. As the results in Table 87 show, children produce significantly more perfective passives (91%) than imperfective passives (9%) in their speech.

Child	Perf. tokens	Perf. %	Imperf. tokens	Imperf. %
Musya (2;8)	3	100	0	0
Nikita (2;6-2;7)	9	90	1	10
Anya B. (2;11-3;4)	28	94	2	6
Mitya (3;5-3;9)	31	100	0	0
Varvara (2;10)	7	87.5	1	12.5
Anya Y. (3;5-3;9)	33	84.6	6	15.4
Sasha (2;4-2;8)	4	80	1	20
Rita (3;0-3;3)	78	90.7	8	9.3
TOTAL	**193**	**91**	**19**	**9**

Table 87.   Distribution of perfective and imperfective passives in child speech.

Further supporting evidence comes from formal and informal adult speech. To examine the hypothesis that the children might prefer the perfective forms to the imperfective ones because the input they received contained more perfective that imperfective forms, adult speech sources were analyzed. The analysis of the data showed that adults produce more imperfective passive forms: 56% of all passives in formal speech and 55.8% in informal direct-speech. This means that the children's' avoidance of imperfective passives cannot be explained by the properties of the input they receive.

So as to rule out the possibility that the perfective/imperfective asymmetry with passive constructions is reflected in a possible asymmetry in active constructions produced by children and/or adults, the authors examined perfective and imperfective

active forms found in random excerpts from their tapescripts. The data showed that the number of perfective actives (48.3%) was not significantly different from the number of imperfective actives (52.8%) in children's speech. As for adults, the proportion of perfectives they produced (45.2%) was not significantly different from the proportion of perfectives in child production. Children behave like adults in their use of aspect with active verbs. So the preference for the perfective aspect is not a tendency in the speech of children but a feature of the passive constructions.

The authors conclude that only the (subject; object) A-chain maturation proposal can explain the asymmetry in the use of perfective and imperfective passive constructions in child Russian. Such an asymmetry suggests that children are using the adjectival passive as an unergative s-homophone for the unaccusative verbal passive construction and therefore the formation of (subject; object) A-chains is not required.

7.3. Greek passives

Borer and Wexler (1992) and Babyonyshev, Ganger, Pesetsky and Wexler (2001) suggested that the crucial factor to understand the pattern of comprehension of passives in child English is that the adjectival passive has the same phonetic form as the verbal passive, namely that it is a syntactic homophone of the verbal passive. The Greek passive has a number of properties that allow us to test the assumptions of Borer and Wexler (1992) and the ACDH: first, the verbal passive is not homophonous to the adjectival passive; second, unlike English, the Greek adjectival passive can appear in full form, that is, with a *by*-phrase.

Terzi and Wexler (2002) aimed to find out whether the predicted difficulties with verbal passives exist in Greek child grammar, whether the adjectival vs. verbal distinction is crucial, as ACDH predicts, and whether the difficulty with the verbal passive can only be overcome if verbal passives have an s-homophone adjectival passive.

Greek has verbal passives and adjectival passives. Let's see this in more detail in the following examples. (162) exemplifies actives, (163) verbal passives:

(162) I fitites   diavasan   to vivlio.

The students read-3p-Act the book

'The students read the book.'

(163) To vivlio   diavastike   (apo tous fitites).

The book read-3s-past-NAct (by the students)

'The book was read (by the students).'

Adjectival passives (164) are introduced by the copula followed by a form that is very much like an adjective but with passive morphology. The –*men* morpheme of the adjectival form below carries the meaning that the accompanying noun is a patient rather than an agent/affector.

(164) To vivlio ine diavasmeno (apo olus tus fitites).

the book is-3s read-nom-sg-neut   (by all students)

'The book was read.'

Next are some core properties of the adjectival passives that are not shared by the verbal passives.

The adjectival passive is inflected for gender, number and Case and agrees with the modified noun and its determiner. Verbal passives are inflected for number, person and Tense, as in (165).

(165) To   diavesmeno   vivlio …

The-nom-neutr-sing read-nom-neutr-sing   book-nom-neutr-

'The read newspaper… .'

Adjectival passives can be coordinated with true adjectives. Coordination of adjectives with verbal passives is impossible.

(166) I efimerida ine diavasmeni ke vromiki.

The newspaper is read and dirty

'The newspaper is read and dirty.'

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Adjectival passives can appear as complements of raising verbs.

(167) I efemerida miazi diavasmeni.

The newspaper seems read

'The newspaper seems read.'

Also there seem to be restrictions as to what type of verbs can be associated with adjectival passives (168a). The same restrictions do not seem to hold for the verbal passives of the same predicates (168b).

(168) a. *O Petro sine akousmenos (apo ti Maria).

the Peter is heard (by Mary)

'Peter is heard (by Mary).'

b. O Petros akougete (apo ti Maria).

the Peter hear-NAct (by Mary)

'Peter is heard (by Mary).'

Lastly, unlike English adjectival passives (Wasow 1977), and like English verbal passives, Greek adjectival passives are compatible with a *by*-phrase.

The prediction of Borer and Wexler's approach is that Greek children, before the maturation of A-chains, will do much worse than English-speaking children on long verbal passives with actional verbs, since the adjectival s-homophone of the verbal passive that is available in English is not available in Greek. Performance on long verbal passives with actional verbs in Greek is expected to resemble the performance on long verbal passives with non-actional verbs in English.

Because adjectival passives do not contain A-chains, the ACDH predicts a better performance on the long adjectival passive than on the long verbal passive. This cannot be done in English since long adjectival passives are not available. The ACDH predicts that children will have no trouble with adjectival passives, even those with a *by*-phrase.

Terzi and Wexler's experiment tested the performance of 30 monolingual Greek speaking children ranging from 3; 8 to 5; 10 years old. They were tested on their

performance of passives of six actional verbs (*push, beat, touch, chase, brush, kiss*) and four non-actional verbs (*love, smell, see, hear*) as close as possible to the verbs tested in the study by Maratsos *et al.* (1985) to facilitate the comparison with the results for English. The experiment was a two-choice picture selection task. Each actional verb was used in two passive sentences, a verbal passive and an adjectival passive. As for non-actional verbs, and due to the fact that no adjectival passives corresponded to them, each verb was used in two verbal passives that were different from each other because the theta roles had been reversed.

The results only include the answers by the children who understood actives in an adult-like manner. See Table 88.

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

Table 88.　　　　　Proportion of correct answers for Greek passives.

From these results it is clear that children's performance on long adjectival passives is very good, even with the presence of the *by*-phrase. However, Greek children showed a poor performance on the long verbal passives of actional verbs and that suggests that they do not make use of an adjectival reading when it comes to interpreting a long passive construction since the adjectival passive is not an s-homophone of the verbal passive. The 3-year-old group only got a 3% of correct responses. They adopted a strategy of selecting the subject in the sentence as the Agent, treating each verbal passive participle as an active verb. The oldest children, 5 years of age, performed only at chance level on verbal passives of actional verbs. Performance on verbal passives of non-actional verbs is slightly worse than on verbal passives of actional verbs.

If we compare the results of Greek with those of Maratsos *et al.,* we find that 4-year-old English speaking children were correct in 85% of actional passives, whereas Greek children were correct only 33% of the time. 5-year-olds showed a similarly huge difference (91% versus 44%).

Now we turn to past participles and deverbal adjectives in Catalan.

7.4.   Past participles and deverbal adjectives in Catalan

Past participles in Catalan appear in different constructions such as the perfect tenses (169), the periphrastic passive already illustrated in (107), and non-finite verbal clauses (170):

(169)   He parlat.

            have spoken

            'I have spoken.'

(170)   Un cop esborrades les fotos es poden trobar a la paperera.

            One time deleted the photos REFLX can find in the trash

            'Once deleted, the photos can be found in trash.'

They can also be found in constructions with *estar* ('to be') (171):

(171)   La porta està oberta.

            the door is open

            'The door is open.'

However, there are a number of past participles that do not seem to behave in the same way:

(172)   *El cistell està omplert.   (Spanish example from Marín 1997)

            the basket is filled

            'The basket is filled.'

The ungrammaticality of (172) is explained if we assume, in accordance with Bosque (1990) and Marín (1997), that in Catalan, the same as in Spanish, there are a number of past participles which seem to appear in a complementary distribution with deverbal adjectives (DA, from now on) with which they share certain morphological and semantic features. We refer to doublets of the kind *omplert/ple* 'filled/full'. A list of such doublets appears in Table 89.

Transitive verb	Past Participle	Deverbal adjective
Assecar (dry)	assecat	sec
Eixugar (dry)	eixugat	eixut
Torçar (bend)	torçat	tort
Embrutar (dirty)	embrutat	brut
Afluixar (loosen)	afluixat	fluix
Endolcir (sweeten)	endolcit	dolç

Table 89.   List of past participles and deverbal adjectives in Catalan.

These DAs appear in contexts where the past participle can't appear. Compare (172) and (173).

(173)   El cistell està ple.   (Spanish example from Marín 1997)

           The basket is full

An element like *ple* ('full') behaves in a similar way to a past participle since it can be used in non-finite verbal clauses, where past participles can be used but where adjectives can't (175).

(174)   Ple el cistell,…   (Spanish example from Marín 1997)

           Full the basket,…

           'The basket being full,….'

(175)   *Alt en Joan,…

           Tall D John, …

           Tall John,…

The verbal nature of these DAs is manifested in sentences with the use of adverbial forms like *un cop* ('once').

(176)   Un cop ple el cistell,….   (Spanish example from Marín1997)

          one time full the basket,…

          'Once the basket is full,….'

Unlike verbal forms, DAs cannot include an Agent complement.

(177)   *Ple ja el cistell per la dependenta,…(Spanish example from Marín1997)

          full already the basket by the shop-assistant,…

          'The basket being already full by the shop assistant, …'

Adverbial forms like *de poc* ('recently') are compatible with past participles (179) but not with DAs (178).

(178)   *una taula seca de poc   (Spanish example from Marín1997)

          a table dry recently

          'a recently dry table'

(179)   un llibre llegit de poc   (Spanish example from Marín1997)

          a book read recently

          'a recently read book'

The fact that DAs cannot appear in compound verbal tenses highlights their condition of non-full verbal forms. Likewise (180) shows their inability to form a periphrastic passive. (Spanish example from Marín 1977).

(180)   *Els vasos han sigut nets per un cambrer.

          the glasses have been clean by a waiter

          'The glasses have been clean by a waiter'.

And let's compare it with the well-formedness of (181), a verbal passive. (Spanish example from Marín 1977).

(181)   Els vasos han sigut netejats per un cambrer.

the glasses have been cleaned by a waiter

'The glasses have been cleaned by a waiter'.

The lack of an implicit argument in adjectival passives, makes it impossible for them to feature by-phrases (182a), Agent-oriented adverbs (182b) and instrumentals (182c):

(182)   a.   *El pastís és dolç pel pastisser.

the cake is sweet PREP pastry chef

'The cake is sweet by the pastry chef.'

          b.   *El pastís és dolç amb generositat.

the cake is sweet PREP generosity

'The cake is sweet with generosity.'

          c.   *El pastis és dolç amb sucre.

the cake is sweet PREP sugar

'The cake is sweet with sugar.'

As for aspectual analysis we follow the distinction made by Vendler (1957) among states (*love, fear*), activities (*run, use*), accomplishments (*build, paint*) and achievements (*discover, win*). Bosque (1990) claims that what makes it impossible for states and activities to appear in non-finite verbal clauses and constructions with *estar* is that they lack a resultative eventive argument. Bosque argues in favour of the verbal and resultative nature of participles. He bases his arguments in the fact that participles, unlike adjectives, possess the capacity to present agentive arguments.

(183)   un vas trencat per la nena

a glass broken by the girl

'a glass broken by the girl'

(184) * un vas ple per el cambrer   (Spanish example from Bosque 1990)

a glass full by the waiter

'a glass full by the waiter'

For the same reason, 'agentive adverbials' like *with difficulty* or *deliberately* are accepted with participles. ((185) is a Spanish example from Jurado 2000).

(185) unes dades deliberadament confoses

some data deliberately confused

'some deliberately confused data'

States cannot appear in non-finite verbal clauses or constructions with *estar.*

(186) *Estimada la teva germana, … (Spanish example from Marín1997)

loved the your sister,…

'Your sister loved,… .'

(187) *La teva germana està estimada.

the your sister is loved

'Your sister is loved.'

Several studies on aspect highlight the importance to distinguish between two kinds of events. Egg (1995) proposes a distinction between non-resultative events and resultative events. The latter enables sentences with *estar*. Passives with [*estar* + telic verb] have a resultative meaning, and passives with [estar + atelic verb] do not have a resultative meaning, since there is no previous change that gives rise to a resultant state over which the perfective effect of the copulative verb is projected. Example (188), presents a telic verb.

(188)   La lliçó ja està explicada.   (Spanish example from Jurado 2000)

         the lesson already is explained

         'The lesson is already explained'.

An important alternation takes place between activities and achievements. (189) is an activity and (190) is an achievement. (Spanish examples from Jurado 2000).

(189)   Passejà pel jardí durant deu minuts.

         walked in the park for ten minutes

         'He walked in the park for ten minutes.'

(190)   Passejà fins al parc en deu minuts.

         walked to the park in ten minutes

         'He walked to the park in ten minutes.'

In (191) even though *escombrar* ('to sweep') is an activity, the internal argument delimits the denoted action and therefore it is [+telic].

(191)   El pati està escombrat.   (Spanish example from Jurado 2000)

         The yard is swept

         'The yard is swept'.

DAs usually appear in *estar* forms, whereas past participles usually appear in compound verbal tenses and periphrastic passives. However, see the following examples of non-finite verbal clauses.

(192)   Un cop buida l'ampolla,…   (Spanish example from Marín 1997)

         one time empty the bottle, …

         'Once the bottle is empty,…'

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(193)   Un cop buidada l'ampolla, …(Spanish example from Marín 1997)

          one time emptied the bottle,…

          'Once the bottle is emptied,…'

In (193) there is the assumption that somebody has emptied the bottle, while in (192) this is one of the two possible interpretations. It could be the case of another interpretation such as that the bottle emptied itself by evaporation.

Also some past participles can appear with *estar* constructions.

(194)   La piscina ja està buidada.   (Spanish example from Marín 1997)

          the swimming pool already is emptied.

          'The swimming pool is already emptied.'

Consequently, not in all cases can we state that past participles and DAs have perfect complementary distribution.

Therefore, in Catalan the same participle can be used in the passive and as an adjective with an adjectival reading in the vast majority of cases; exceptions are found in the form of the doublets we mentioned before. The only difference between both types of sentence is the usage of the auxiliary, which in Catalan can adopt the form of *ser or estar*. *Ser* is used in the periphrastic passive along with the past participle of the verb and makes a short passive. *Estar* is used with the past participle of the verb, which works as an adjective, and makes an adjectival passive.

(195)   a.   La germana petita és pentinada.   Verbal passive

                 the sister little is combed

                 'Little sister's hair is combed.'

          b.   La germana petita està pentinada.   Adjectival passive

                 the sister little is combed

                 ´Little sister's hair is combed,'

We also have to take into account that *ser* can be used in statives like:

(196)   És mort

          'He is dead.'

(197)   La porta és oberta.

          'The door is open.'

Such fluctuation was taken into account in the experiment and statives were avoided.

The verbs used in the experiment are telic agentive verbs that give rise to adjectival passives and therefore select the auxiliary *estar*. The selection of the auxiliary *estar* implies that the sentences tested are not s-homophones with the corresponding verbal passives, in contrast to what happens in their English counterparts. They are exemplified in (195 a-b).

7.5.   Experimental design

The task was a picture selection task as in Experiments 1 and 2. The children heard short passive sentences or adjectival passive sentences while they looked at a picture describing the sentence and a distractor, and they had to choose which picture was the one the sentence described. The sentences were semantically reversible, so that interpretation rested solely on grammatical knowledge.

There were always two characters on each picture. One picture showed the correct subject performing the action, for example, the grandmother combing the mum, and the other picture showed the finished action, mum having been combed. That is, an action being carried out, and another were we could see the result of the previous action.

To show this in a clearer way we can look at Figure 14.

Figure 14.   Part III. Recorded sentence: La mare és pentinada. 'Mum's hair is combed.'

The task comprised 8 sentences with male characters and 8 sentences with female characters, and the 16 sentences were of types: 8 short (truncated) passive sentences (198), and 8 adjectival passive sentences (199).

(198)   La mare és pentinada.
         the mother is combed
         'Mum's hair is combed.'

(199)   La mare està pentinada.
         the mother is combed
         'Mum's hair is combed.'

Sentences were presented in random order. A complete list of the items used can be found in Appendix E.

The prediction is that if children give the passive an adjectival interpretation then they will choose the picture that depicts a state over the picture that depicts an event. Actional verbs allow a resultative reading since they involve a target state. The prediction is also that children will perform well on adjectival passives.

7.5.1. Procedure

The procedure was the same as in Experiments 1 and 2. Each test item was presented at most twice. The children were not corrected for wrong responses. The test took about 10 minutes per child on average, and was run individually in a quiet room in the school.

7.5.2. Subjects

Children aged 3-8 years old took part in the experiment, 20 children for each age group plus 20 adults. They were all native speakers of Catalan from the Barcelona metropolitan area. The details of the children are as in Table 90.

Age groups	Age range	N	Mean age
3-year-olds	3;0-3;11	20 children	3;6
4-year-olds	4;0-4;11	20 children	4;6
5-year-olds	5;0-5;11	20 children	5;5
6-year-olds	6;0-6;11	20 children	6;5
7-year-olds	7;0-7;11	20 children	7;6
8-year-ods	8;0-8;11	20 children	8;6
Adults	Adults	20 adults	

Table 90.　　　　Age range, number of children and mean age.

For children, we categorized them in two ways: for age in years, and as 'years young' and 'years older', where 'years young' is up to and including 6 months and 'years older' is from 7 months up to and including 11 months. The distribution of the children according to the second criterion is as in Table 91. The reason why we distinguish between these age groups is because we want to know whether maturation takes place, for instance, at six years of age or at six and a half.

Age	N	Percentage
3 Young	9	6.43
3 Older	11	7.85
4 Young	8	5.71
4 Older	12	8.57
5 Young	9	6.43
5 Older	11	7.89
6 Young	10	7.14
6 Older	10	7.14
7 Young	7	5.00
7 Older	13	9.29
8 Young	5	3.57
8 Older	15	10.71
Adult	20	14.28

Table 91.   Distribution of the variable young and older ages.

All of the children were acquiring Catalan as their first language and spoke Catalan at home at least to one parent. The adults were Catalan speakers as well.

7.5.3. Statistical methods

We used the Generalised Linear Model and the Logistic Regression Model (McCullagh, P*., J.A*. Nelder 1989*)*. All the results were obtained with SAS software 9.2 version (SAS System, Cary, NC, USA, 2009) and were performed by the Servei d'Estadística Aplicada of the UAB.

7.6.   Results

In the results shown in Table 92 we can see the percentages which indicate that the resultative interpretation of the short passive was overwhelmingly preferred over the passive interpretation, while adjectivals were correctly interpreted over half of the time for all age groups.

Age group	Short passive	Stative passive
3-year-olds	38.75 %	63.13 %
4-year-olds	35 %	70 %
5-year-olds	23.13 %	83.13 %
6-year-olds	28.75 %	81.88 %
7-year-olds	90%	95.63%
8-year-olds	92.50%	99.38%
adults	96.88 %	98.13 %

Table 92.　　　Percentage of target comprehension.

Given that the variable of interest is the answer that the children and adults have given, next are the tables for the total of correct answers according to age. See Table 93 for whole age groups.

Age	Type	Mean	St	N
3	Short passive	3.10	2.10	20
	Stative passive	5.05	1.82	20
4	Short passive	2.80	1.96	20
	Stative passive	5.60	1.64	20
5	Short passive	1.85	1.35	20
	Stative passive	6.65	1.09	20
6	Short passive	2.30	2.25	20
	Stative passive	6.55	1.36	20
7	Short passive	7.20	1.28	20
	Stative passive	7.65	0.67	20
8	Short passive	7.40	1.27	20
	Stative passive	7.95	0.22	20
Adult	Short passive	7.70	0.57	20
	Stative passive	7.85	0.37	20

Table 93.　　　Number of correct answers over 8 according to whole age groups.

See Table 94 for split age groups.

Age	Type	Mean	Std	N
3 Young	Short passive	3.78	1.92	9
	Stative passive	4.56	1.88	9
3 Older	Short passive	2.55	2.16	11
	Stative passive	5.45	1.75	11
4 Young	Short passive	3.50	1.93	8
	Stative passive	5.13	1.81	8
4 Older	Short passive	2.33	1.92	12
	Stative passive	5.92	1.51	12
5 Young	Short passive	1.89	1.76	9
	Stative passive	7.33	0.71	9
5 Older	Short passive	1.82	0.98	11
	Stative passive	6.09	1.04	11
6 Young	Short passive	2.20	2.15	10
	Stative passive	6.30	1.77	10
6 Older	Short passive	2.40	2.46	10
	Stative passive	6.80	0.79	10
7 Young	Short passive	7.00	1.83	7
	Stative passive	7.43	0.98	7
7 Older	Short passive	7.31	0.95	13
	Stative passive	7.77	0.44	13
8 Young	Short passive	7.60	0.89	5
	Stative passive	8.00	0.00	5
8 Older	Short passive	7.33	1.40	15
	Stative passive	7.93	0.26	15
Adult	Short passive	7.70	0.57	20
	Stative passive	7.85	0.37	20

Table 94.   Number of correct answers over 8 according to split age group.

For short passive sentences, in column N is the total number of children and adults that have answered. We observe that there is a sentence with no answer. See Table 95.

Age	N	Variable	Mean	Std Dev
3	20	percent	38.75	26.25
4	20	percent	35.00	24.54
5	20	percent	23.13	16.86
6	20	percent	28.75	28.13
7	20	percent	90.00	16.02
8	20	percent	92.50	15.92
Adult	20	percent	96.88	6.88

Table 95.   Percentage of correct short passive sentences according to age.

We can see that the 5-year-old group performs worse than their 3-, 4- and 6 – year-old peers. The 3- and 4-year-old groups (38.75%; 35%) perform better than the 5- and 6-year-old groups (23.13%; 28.75%). At 7 and 8 there is a sudden boost in the percentage of correct answers, which is adult-like. See it graphically in Figure 15.
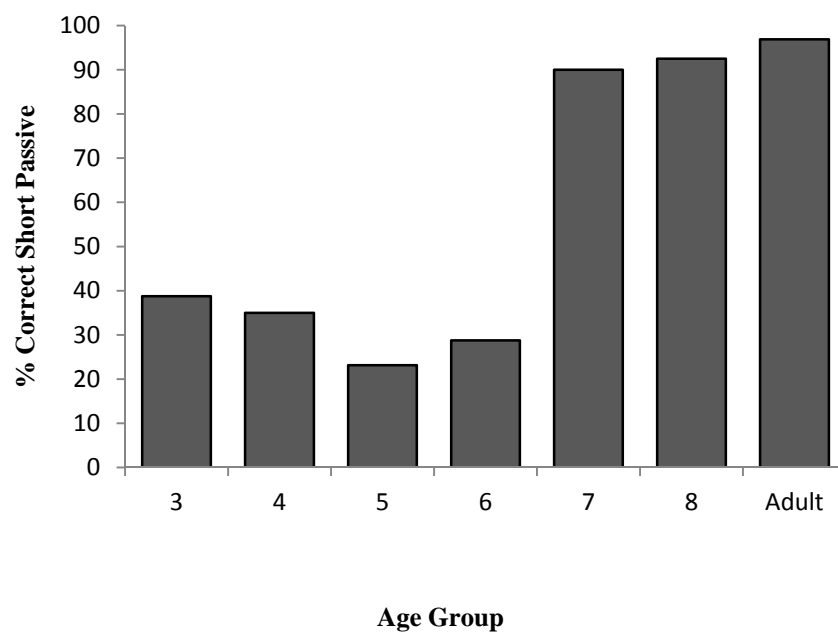
Figure 15.   Percentage of correct short passive sentences for whole age groups.

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In Table 96 we can see the results according to split age groups.

Age	N	Variable	Mean	Std Dev
3 Young	9	percent	47.22	24.03
3 Older	11	percent	31.82	27.02
4 Young	8	percent	43.75	24.09
4 Older	12	percent	29.17	24.03
5 Young	9	percent	23.61	22.05
5 Older	11	percent	22.73	12.27
6 Young	10	percent	27.50	26.87
6 Older	10	percent	30.00	30.73
7 Young	7	percent	87.50	22.82
7 Older	13	percent	91.35	11.84
8 Young	5	percent	95.00	11.18
8 Older	15	percent	91.67	17.47
Adult	20	percent	96.88	6.88

Table 96.   Percentage of correct short passive sentences according to split age groups.

The 3- and the 4- young groups perform better than their older group counterparts. We can see it graphically in Figure 16.
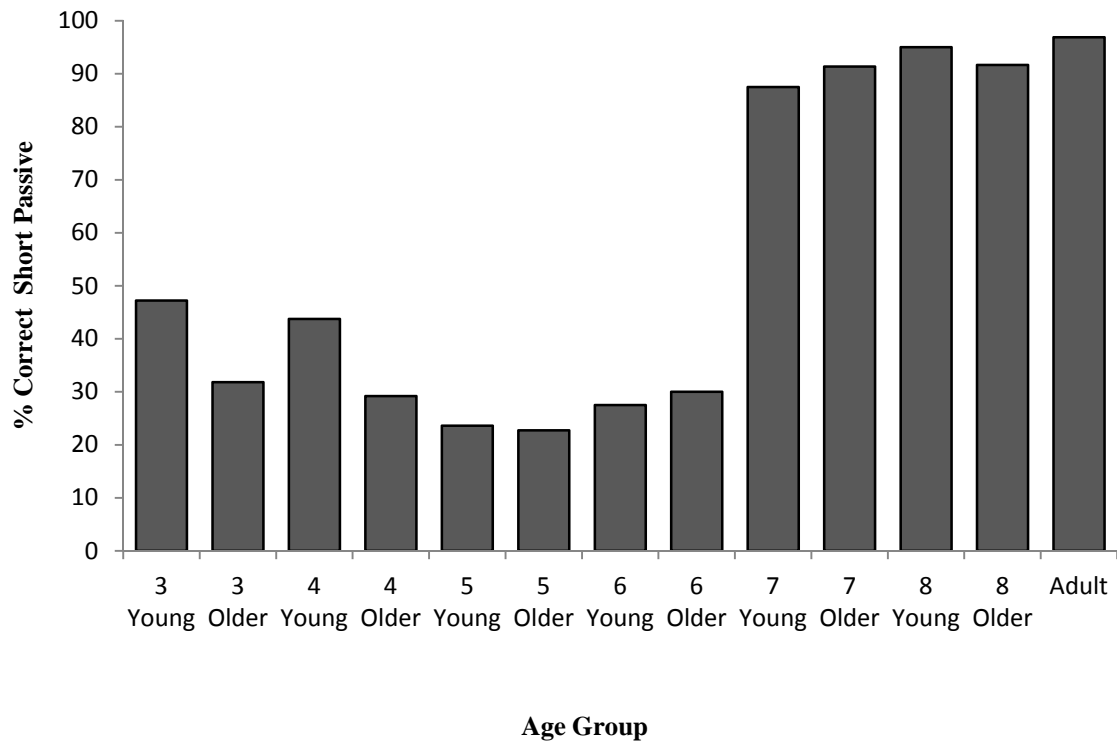
Figure 16.   Percentage of correct short passive sentences for split age groups.

For adjectival passive sentences, in column N is the total number of children and adults that have answered. See Table 97.

Age	N	Variable	Mean	Std Dev
3	20	percent	63.13	22.75
4	20	percent	70.00	20.44
5	20	percent	83.13	13.62
6	20	percent	81.88	16.95
7	20	percent	95.63	8.39
8	20	percent	99.38	2.80
Adult	20	percent	98.13	4.58

Table 97.   Percentage of correct adjectival passive sentences according to whole age groups.

These results show a much better performance for adjectival passives than for short passives. This can be seen graphically in Figure 17.

Age Group
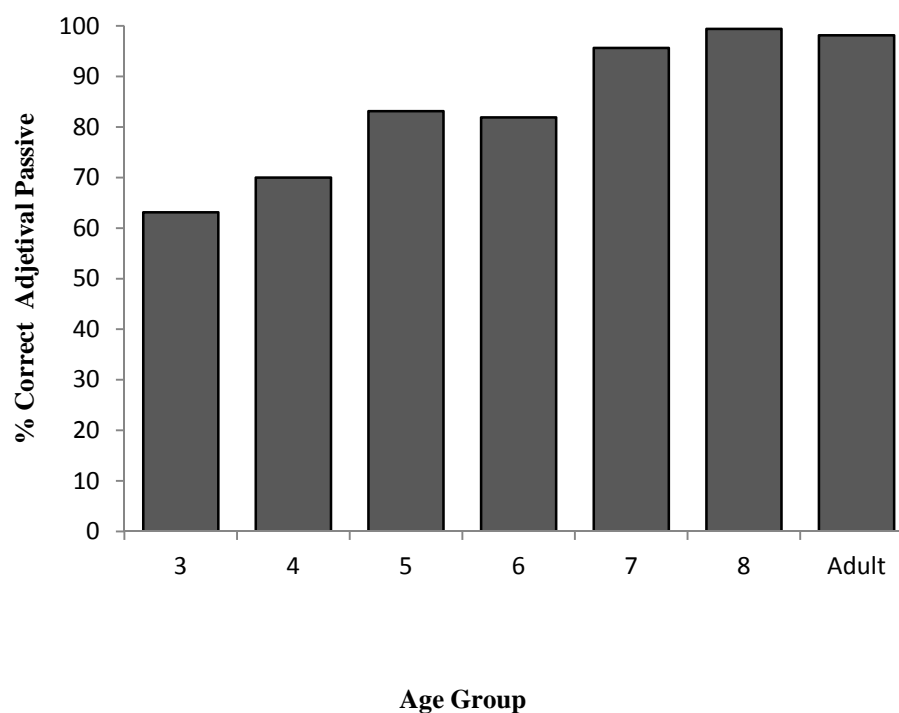
Figure 17.   Percentage of orrect adjectival passive sentences for whole age groups.

For split age groups the results are reported in Table 98.

Age	N	Variable	Mean	Std Dev
3 Young	9	percent	56.94	23.48
3 Older	11	percent	68.18	21.91
4 Young	8	percent	64.06	22.60
4 Older	12	percent	73.96	18.81
5 Young	9	percent	91.67	8.84
5 Older	11	percent	76.14	13.06
6 Young	10	percent	78.75	22.09
6 Older	10	percent	85.00	9.86
7 Young	7	percent	92.86	12.20
7 Older	13	percent	97.12	5.48
8 Young	5	percent	100.00	0.00
8 Older	15	percent	99.17	3.23
Adult	20	percent	98.13	4.58

Table 98.   Percentage of correct adjectival passive sentences according to split age

groups.

In Table 98, we can see that the older group gets better results than the young group, with the exception of the 5 young that performs slightly better than the 5 older group. We can see these results in Figure 18.
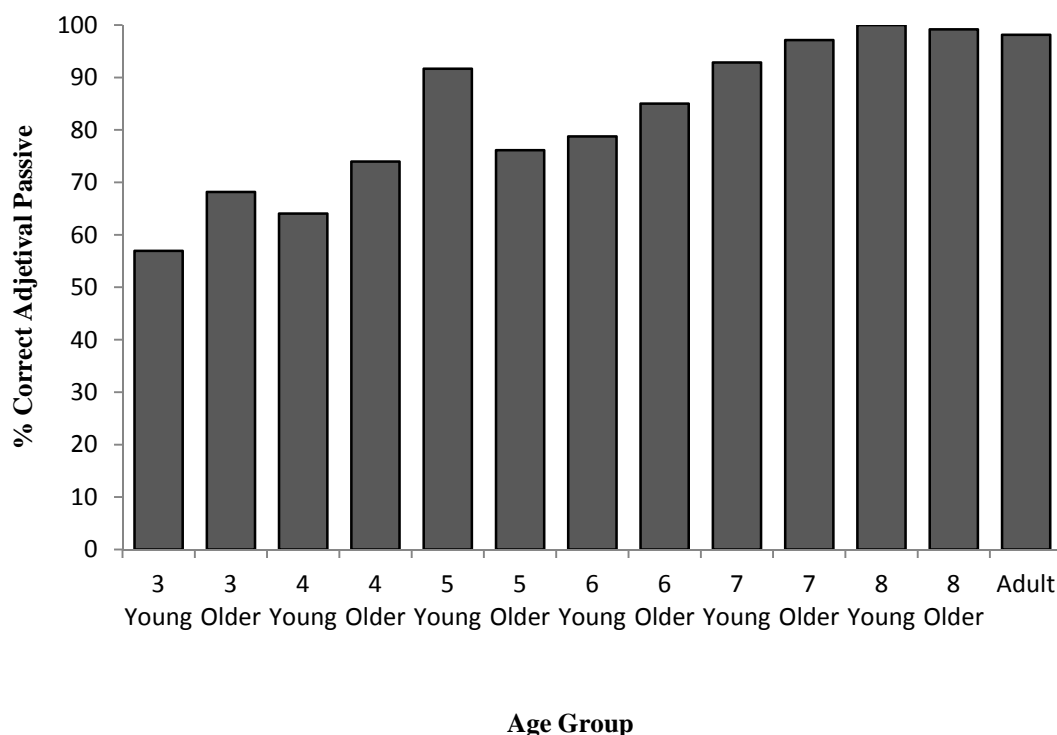
Figure 18.   Percentage of correct adjectival sentences according to split age groups.

There are very significant statistic differences between adjectival passives and short passives. The quantification of this difference can be found in the odds ratio statistic, which expresses how higher the odds are of obtaining a correct answer for adjectival passives than for short passives is. As can be seen in the table, we find that the odds of obtaining a correct answer in an adjectival sentence is nearly 6 times higher than that of a short passive sentence. (OR = 5.598, $CI_{95\%}$(= (4.458, 7.029)). See Table 99.

esta	_esta	Odds Ratio	Lower Odds Ratio	Upper Odds Ratio
Adjectival passive	Short passive	**5.598**	**4.458**	**7.029**

Table 99.   Adjectival passives vs. Short passives.

If we consider only the short passives, the age effect is significant: adults is the group that presents statistically significant differences. The 3- and 4-year-old groups present practically no differences. So can be said between the 5- and the 6-year-old groups. See Table 100.

Agec	Agec	Odds Ratio	Lower Odds Ratio	Upper Odds Ratio
3	4	1.186	0.360	3.901
3	5	2.157	0.638	7.297
3	6	1.659	0.494	5.577
3	**7**	**0.056**	**0.014**	**0.221**
3	**8**	**0.039**	**0.009**	**0.166**
3	**Adult**	**0.018**	**0.003**	**0.103**
4	5	1.819	0.536	6.178
4	6	1.399	0.415	4.722
4	**7**	**0.047**	**0.012**	**0.187**
4	**8**	**0.033**	**0.008**	**0.140**
4	**Adult**	**0.015**	**0.003**	**0.087**
5	6	0.769	0.222	2.667
5	**7**	**0.026**	**0.006**	**0.105**
5	**8**	**0.018**	**0.004**	**0.079**
5	**Adult**	**0.008**	**0.001**	**0.049**
6	**7**	**0.034**	**0.008**	**0.136**
6	**8**	**0.023**	**0.005**	**0.102**
6	**Adult**	**0.011**	**0.002**	**0.063**
7	8	0.686	0.137	3.428
7	Adult	0.317	0.048	2.084
8	Adult	0.463	0.066	3.251

Table 100.   Short passives. Age effects.

As for the adjectivals, there are also statistically significant differences among the age groups except in the 3- and 4-year-olds ,which do not present statistically significant differences as far as correct answer proportion is concerned; the 5- and 6-

year-old groups do not present statistically significant differences, either. See Table 101.[1]

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[1] Oliva and Wexler (in preparation) replicated our experiment and found identical results to the ones we have just shown in Spanish adjectivals. On my part, I ran the experiment on Spanish adjectivals in the province of San Juan (Argentina). The same items were used and the same procedure carried out as with the Catalan children. However, as it is shown in Table 105 children did not comprehend short passives and adjectival passives until they were 8 years of age. We are unclear about the reason for these poor and less clear-cut results from Argentinian Spanish.

Age group	Short passive	Adjectival passive
3-year-olds	63.3 %	50.8%
4-year-olds	65%	45.83%
5-year-olds	45.83%	61.66%
6-year-olds	54%	58.3%
7-year-olds	49%	64.16%
8-year-olds	85%	91.66%
9-year-olds	86.66%	95.83%
adults	100%	100%

Results for short passive vs. stative passive in Argentinian Spanish.

Agec	Agec	Odds Ratio	Lower Odds Ratio	Upper Odds Ratio
3	4	0.732	0.295	1.817
3	**5**	**0.346**	**0.130**	**0.920**
3	**6**	**0.374**	**0.142**	**0.986**
3	**7**	**0.078**	**0.020**	**0.309**
3	**8**	**0.011**	**<0.001**	**0.239**
3	**Adult**	**0.033**	**0.005**	**0.219**
4	5	0.472	0.175	1.273
4	6	0.511	0.191	1.365
4	**7**	**0.107**	**0.027**	**0.427**
4	**8**	**0.015**	**<0.001**	**0.328**
4	**Adult**	**0.045**	**0.007**	**0.302**
5	6	1.082	0.380	3.082
5	**7**	**0.226**	**0.054**	**0.946**
5	**8**	**0.032**	**0.001**	**0.709**
5	**Adult**	**0.096**	**0.014**	**0.661**
6	**7**	**0.209**	**0.050**	**0.868**
6	**8**	**0.029**	**0.001**	**0.653**
6	**Adult**	**0.088**	**0.013**	**0.608**
7	8	0.140	0.005	3.632
7	Adult	0.423	0.049	3.675
8	Adult	3.026	0.091	100.975

Table 101.   Adjectival passives. Age effects.

7.7.   Conclusions

Our results clearly support Horgan's basic observation that children's early passives are 'almost exclusively after-the-fact observations on the state of things' (1978: 68), as well as the experimental findings of Maratsos, Fox, Becker, and Chalkley (1985) that children have a much easier time understanding passives in which the participle denotes the observable result of some action.

The adjectival interpretation of the short passive was significantly preferred over the passive interpretation. Adjectivals were correctly interpreted over half of the time for all age groups. This means that children understand adjectival passives very well and also that when confronted with a short passive, they give this an adjectival

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interpretation. This holds for all age groups up to age 6. Also, the older the children, the better performance in adjectival passive sentences they make. The opposite is true when it comes to the short passive performance. There doesn't seem to be a clear development in the comprehension of short passives as age progresses until the age of 7 is reached when there is a sudden increase in their performance and they attain more than 75% correctness. Before that children do not distinguish between a short passive sentence and an adjectival sentence. They give short passives an adjectival interpretation. We conclude that experiment 3 provides independent evidence for the adjectival interpretation of the short passive in child grammar.

Chapter 8. General conclusions

8.1.   Summary of main findings

The spontaneous production study showed that verbal passives are scarcely heard by Catalan children. Likewise the production of passive constructions is almost non-existent. Still, it is well known that constructions which are uncommon in the input are often well comprehended by children. In Peninsular Catalan children do not comprehend long passives of actional verbs until they are at least 6 years of age, when there is a sudden increase in their understanding of long passives. Other studies have shown better understanding of long passives when there is more than one competing agent, which is the case of the experiments. But it is not our case. Therefore, having more than one agent to choose from in a comprehension study does not entail better performance. Before age 6, children interpret long passives as actives, which, in turn, are well understood by Catalan children at the different ages tested. This was an expected result. Another of our findings is that short passives are better understood than long passives, or at least so they appear. Wexler's hypothesis that predicts that passives should cease to be problematic after age 5 as a result of maturation is consistent with the results here. The claim that in languages where there is no homophony between short passives and adjectival passives children are delayed on all verbal passives is also corroborated by our results.

It has been argued that the presence of the *by*-phrase is of obvious importance for the acquisition of passives. And, specifically, in the case of Majorcan Catalan where the preposition *de* is both used in agentive nominals and in the long passive there was reason to believe that there could be some facilitation in comprehension according to

Fox and Grodzinsky's hypothesis. This has proved to be an incorrect prediction. The claim that the *by*-phrase can facilitate the comprehension of long actional passives when the agentive phrase is introduced by an independently agentive preposition cannot be maintained. Worse still, Majorcan Catalan children offered a poorer performance in long passives compared to their Peninsular Catalan peers.

In the third experiment, the adjectival interpretation of the short passive was significantly preferred over the passive interpretation and adjectivals were very well understood. At age 7 there is a sudden boost in the children's performance. Up to that age, children are shown to give the short passive an adjectival interpretation. Despite the fact that Catalan lacks the s-homophony of English verbal and adjectival passives, we conclude that there is enough evidence that Catalan children give an adjectival interpretation to the short passive construction.

8.2.   Future research

As a follow-up to the research in this thesis, it would be of interest to run experiments on the comprehension of raising by Catalan-speaking children and to see whether there is a perfect correlation between both paths of acquisition: raising and passive verbal constructions. Specifically the study should include unraised and raised sentences. Also an experiment where actional verbs were tested alongside non-actionals verbs would be worthwhile. Another interesting experiment would be to use the present progressive passive construction: *L'àvia està sent pentinada per la germana gran* 'The grandmother is being combed by the older sister' instead of the present simple passive constructions that we used in the different experiments undertaken in this thesis. There could be an improvement in the comprehension of this passive construction since the progressive form entails an exclusively verbal interpretation, incompatible with an adjectival reading. We could expect better performance under that condition.

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Appendices

Appendix A: MLUs for the children whose productions were searched

Name	File	Age	MLU
Jordina	Jor01.cha	1;7.16	2.045
Jordina	Jor02.cha	1;7.23	1.785
Jordina	Jor03.cha	1;8.03	1.960
Jordina	Jor04.cha	1;8.27	1.552
Jordina	Jor05.cha	1;9.11	1.865
Jordina	Jor06.cha	1;9.25	2.154
Jordina	Jor07.cha	1;10,24	2.543
Jordina	Jor08.cha	1;11.06	2.544
Jordina	Jor09.cha	2;7.09	3.358
Jordina	Jor10.cha	2;9.18	3.178
Jordina	Jor11.cha	2;10.16	3.821

Table 102.   MLU for Jordina

Name	File	Age	MLU
Júlia	Jul107.cha	1;7.19	1.152
Júlia	Jul108a.cha	1;8.08	1.400
Júlia	Jul108b.cha	1;8.21	1.889
Júlia	Jul109a.cha	1;9.13	1.296
Júlia	Jul109b.cha	1;9.28	1.429
Júlia	Jul110.cha	1;10.24	1.250
Júlia	Jul111a.cha	1;11.10	1.375
Júlia	Jul111b.cha	1;11.23	1.454
Júlia	Jul200a.cha	2;0.13	1.625
Júlia	Jul200b.cha	2;0.26	1.789
Júlia	Jul201a.cha	2;1.11	1.932
Júlia	Jul201b.cha	2,1.25	1.793
Júlia	Jul202.cha	2;2.11	1.806
Júlia	Jul203.cha	2;3.10	2.083
Júlia	Jul204.cha	2;4.08	1.372
Júlia	Jul205.cha	2,5.08	2.333
Júlia	Jul206.cha	2;6.25	2.746

Table 103.   MLU for Júlia

Name	File	Age	MLU
Àlvar	Alv14.cha	1;2.28	1.065
Àlvar	Alv15.cha	1;3.18	1.153
Àlvar	Alv16.cha	1;4.08	1.095
Àlvar	Alv17.cha	1;5.01	1.171
Àlvar	Alv18.cha	1;5.27	1.219
Àlvar	Alv19.cha	1;7.13	1.000
Àlvar	Alv20.cha	1;8.14	1.071
Àlvar	Alv24.cha	1;11.27	1.406
Àlvar	Alv25.cha	2;1.22	1.413
Àlvar	Alv26.cha	2;2.06	1.836
Àlvar	Alv27-1.cha	2;2.28	2.000
Àlvar	Alv27-2.cha	2;3.16	2.109
Àlvar	Alv28.cha	2;4.07	1.847
Àlvar	Alv29.cha	2;5.13	1.973
Àlvar	Alv30.cha	2;6.25	1.907
Àlvar	Alv31.cha	2;7.16	2.290
Àlvar	Alv32.cha	2;7.29	2.794
Àlvar	Alv33.cha	2;9.11	3.021
Àlvar	Alv35.cha	2;11.13	3.368
Àlvar	Alv36.cha	3;0.13	2.553
Àlvar	Alv37.cha	3;1.13	2.818

Table 104.   MLU for Àlvar

Name	File	Age	MLU
Gisela	Gis19.cha	1;7.14	1.043
Gisela	Gis20.cha	1;8.03	1.024
Gisela	Gis21.cha	1;8.24	1.131
Gisela	Gis22.cha	1;9	1.156
Gisela	Gis23.cha	1;10.07	1.141
Gisela	Gis24.cha	1;11.11	1.089
Gisela	Gis25.cha	2;1.23	1.528
Gisela	Gis26.cha	2;2.06	1.500
Gisela	Gis28.cha	2;4.25	1.581
Gisela	Gis30.cha	2;6.23	2.319
Gisela	Gis32.cha	2;8	2.613
Gisela	Gis33.cha	2;9.16	2.680
Gisela	Gis35.cha	2;11	2.600
Gisela	Gis37.cha	3;0.29	2.629
Gisela	Gis41.cha	3;5.15	2.657
Gisela	Gis42.cha	3;6.28	3.505
Gisela	Gis46.cha	3;10.02	2.954
Gisela	Gis48.cha	3;11.14	2.705
Gisela	Gis49.cha	4;0.24	2.222
Gisela	Gis50.cha	4;2.03	3.411

Table 105.   MLU for Gisela

Name	File	Age	MLU
Guillem	Gui16.cha	1;1,29	1.047
Guillem	Gui17.cha	1;4.26	1.008
Guillem	Gui19.cha	1;7,15	1.100
Guillem	Gui20.cha	1;8	1.364
Guillem	Gui21.cha	1;9,12	1.269
Guillem	Gui22.cha	1;9,24	1.464
Guillem	Gui23.cha	1;11,13	1.671
Guillem	Gui24.cha	2;0,12	1.369
Guillem	Gui25.cha	2;1,14	1.265
Guillem	Gui26.cha	2;2,11	1.440
Guillem	Gui27a.cha	2;2,28	1.539
Guillem	Gui27b.cha	2;3,12	1.667
Guillem	Gui28.cha	2;3,18	1.419
Guillem	Gui29.cha	2;4,24	1.584
Guillem	Gui30a.cha	2;5,25	1.494
Guillem	Gui30b.cha	2;5,29	1.649
Guillem	Gui30c.cha	2;6,10	1.641
Guillem	Gui31.cha	2;7,09	1.600
Guillem	Gui32.cha	2;7,25	1.797
Guillem	Gui33.cha	2;9,08	1.989
Guillem	Gui34.cha	2;10,03	2.000
Guillem	Gui35a.cha	2;11,05	1.991
Guillem	Gui35b.cha	2;11,21	2.933
Guillem	Gui35c.cha	2;11,25	2.443
Guillem	Gui36.cha	3; 0	3.875
Guillem	Gui37.cha	3;1,18	2.477
Guillem	Gui39.cha	3;3,19	2.273
Guillem	Gui40.cha	3;4,19	2.711
Guillem	Gui42.cha	3;6,11	3.156
Guillem	Gui43.cha	3;7,16	2.747
Guillem	Gui47.cha	3;10,28	2.954
Guillem	Gui48.cha	3;11,20	2.846
Guillem	Gui49.cha	4; 0	2.529

Table 106.   MLU for Guillem

Name	File	Age	MLU
Laura	Lau20.cha	1;7,20	1.032
Laura	Lau21.cha	1;9,07	1.091
Laura	Lau22.cha	1;10,22	1.147
Laura	Lau23.cha	1;11,12	1.150
Laura	Lau26.cha	2;2,05	1.353
Laura	Lau27.cha	2;2,13	1.302
Laura	Lau28.cha	2;4,11	1.444
Laura	Lau29.cha	2;5,08	1.635
Laura	Lau30.cha	2;6,25	1.756
Laura	Lau31.cha	2;7,20	1.777
Laura	Lau32.cha	2;8,30	1.883
Laura	Lau35.cha	2;11,17	1.071
Laura	Lau36.cha	3;0,02	2.417
Laura	Lau39.cha	3;3,12	3.456
Laura	Lau41.chi	3;5,13	2.545
Laura	Lau46a.chi	3;10	2.966
Laura	Lau46b.chi	3;10,1	2.907
Laura	Lau47.chi	3;11,12	2.997
Laura	Lau48.chi	4;0,10	2.738

Table 107. MLU for Laura

Appendix B: Complete list of the sentences used on part II of Experiments 1-3

Subject and object sentences

Qui dibuixa a qui?	Who is drawing whom?
Qui embruta a qui?	Who is dirtying whom?
Qui acaricia a qui?	Who is stroking whom?
Qui dibuixa a qui?	Who is drawing whom?
Qui embruta a qui?	Who is dirtying whom?
Qui acaricia a qui?	Who is stroking whom?

Subject and object sentences

Qui fa pessigolles a qui?	Who is tickling whom?
Qui pica aqui?	Who is hitting whom?
Qui mossega a qui?	Who is biting whom?
Qui fa pessigolles a qui?	Who is tickling whom?
Qui pica a qui?	Who is hitting whom?
Qui mossega a qui?	Who is biting whom?

Appendix C: Complete list of the sentences used on part III of Experiment 1

Female, short passive

Active	La germana petita empeny la germana gran.	The little sister is pushing the big sister.
Active	La germana petita ausculta la germana gran.	The little sister is examining the big sister.
Passive	La mare és besada.	Mom is kissed.
Passive	L'àvia és alimentada.	Grandma is fed.
Active	La germana gran renta la mare.	The big sister is washing Mom.
Passive	La germana gran és perseguida.	The big sister is chased.
Passive	La germana petita és rascada.	The little sister is scratched.
Active	L'àvia pentina a la mare.	Grandma is combing Mom.
Active	La germana gran dibuixa la mare.	The big sister is drawing Mom.
Passive	La germana petita és embrutada.	The little sister is dirtied.
Active	L'àvia acaricia la germana petita.	Grandma is stroking the little sister.
Passive	La germana pentita és empentada.	The little sister is pushed.
Passive	La germana petita és auscultada.	The little sister is examined.
Active	La mare besa la germana petita.	Mom is kissing the little sister.
Active	L'àvia alimenta la germana petita.	Grandma is feeding the little sister.
Passive	La germana gran és rentada.	The big sister is washed.
Active	La germana gran persegueix la germana petita.	The big sister is chasing the little sister.
Active	La germana petita rasca la germana gran.	The little sister is scratching the big sister.
Passive	L'àvia és pentinada.	Grandma is combed.
Passive	La germana gran és dibuixada.	The big sister is drawn.
Active	La germana petita embruta la germana gran.	The little sister is dirtying the big sister.
Passive	L'àvia és acariciada.	Grandma is stroked

Male, short passive

Active	L'avi abraça el germà petit.	Grandpa hugs the little brother.
Active	El pare eixuga el germà gran.	Papa dries the big brother.
Passive	El pare és tapat.	Papa is covered.

Active	El germà petit porta a coll el germà gran.	The little brother is carrying the big brother.
Passive	El germà gran és tibat.	The big brother is pulled.
Active	El pare afaita l'avi.	Papa is shaving Grandpa.
Passive	El germà gran és fotografiat.	The big brother is photographed.
Passive	El pare és pintat.	Papa is face-painted.
Active	El germà gran fa pesigolles al germà petit.	The big brother is tickling the little brother.
Passive	El germà petit és picat.	The little brother is hit.
Active	El germà petit mossega al germà gran.	The little brother is biting the big brother.
Passive	L'avi és abraçat.	Grandpa is hugged.
Passive	El pare és eixugat.	Papa is dried.
Active	El pare tapa el germà petit.	Papa is covering the little brother.
Passive	El germà petit és portat a coll.	The little brother is carried.
Active	El germà gran tiba el pare.	The big brother is pulling Papa.
Passive	El pare és afaitat.	Papa is shaved.
Active	El germà gran fotografia l'avi.	The big brother is photographing Grandpa.
Active	El pare pinta el germà petit.	Papa is face-painting the little brother.
Passive	El germà gran és pessigollejat.	The big brother is tickled.
Active	El germà petit pica el germà gran.	The little brother is hitting the big brother.
Passive	El germà petit és mossegat.	The little brother is bitten.

Female, long passive

Active	La germana gran empeny la germana petita.	The big sister is pushing the little sister.
Active	La germana gran ausculta la germana petita.	The big sister is examining the little sister.
Passive	La germana petita és besada per la mare.	The little sister is kissed by Mom.
Passive	La germana petita és alimentada per l'àvia.	The little sister is fed by Grandma.
Active	La mare renta la germana gran.	Mom is washing the big sister.
Passive	La mare és perseguida per la germana gran.	Mom is chased by the big sister.
Passive	La germana gran és rascada per la germana petita.	The big sister is scratched by the little sister.
Active	La mare pentina l'àvia.	Mom is combing Grandma.
Active	La mare dibuixa la germana gran.	Mom is drawing a picture of the big

		sister.
Passive	La germana gran és embrutada per la germana petita.	The big sister is dirtied by the little sister.
Active	La germana petita acaricia l'àvia.	The little sister is stroking Grandma.
Passive	La germana gran és empentada per la germana petita.	The big sister is pushed by the little sister.
Passive	La germana gran és auscultada per la germana petita.	The big sister is examined by the little sister.
Active	La germana petita besa la mare.	The little sister is kissing Mom.
Active	La germana petita alimenta l'àvia.	The little sister is feeding Grandma.
Passive	La mare és rentada per la germana gran.	Mom is washed by the big sister.
Active	La mare persegueix la germana gran.	Mom is chasing the big sister.
Active	La germana gran rasca la germana petita.	The big sister is scratching the little sister.
Passive	La mare és pentinada per l'àvia.	Mom is combed by Grandma.
Passive	La mare és dibuixada per la germana gran.	Mom is drawn by the big sister.
Active	La germana gran embruta la germana petita.	The big sister is dirtying the little sister.
Passive	La germana petita és acariciada per l'àvia.	The little sister is stroked by Grandma.

Male, long passive

Active	El germà petit abraça l'avi.	The little brother is hugging Grandpa.
Active	El germà gran eixuga el pare.	The big brother is drying Papa.
Passive	El germà petit és tapat pel pare.	The little brother is covered by Papa.
Active	El germà gran porta a coll el germà petit.	The big brother is carrying the little brother.
Passive	El pare és tibat pel germà gran.	Papa is pulled by the big brother.
Active	L'avi afaita el pare.	Grandpa is shaving Papa.
Passive	L'avi és fotografiat pel germà gran.	Grandpa is photographed by the big brother.
Passive	El germà petit és pintat pel pare.	The little brother is face-painted by Papa.

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Active	El germà petit fa pessigolles al germà gran.	The little brother is tickling the big brother.
Active	El germà gran és picat pel germà petit.	The big brother is hit by the little brother.
Active	El germà gran mossega el germà petit.	The big brother is biting the little brother.
Passive	El germà petit és abraçat per l'avi.	The little brother is hugged by Grandpa.
Passive	El germà gran és eixugat pel pare.	The big brother is dried by Papa.
Active	El germà petit tapa el pare.	The little brother is covering Papa.
Passive	El germà gran és portat pel germà petit.	The big brother is carried by the little brother.
Active	El pare tiba el germà gran.	Papa is pulling the big brother.
Passive	L'avi és afaitat pel pare.	Grandpa is shaved by Papa.
Active	L'avi fotografia el germà gran.	Grandpa is photographing the big brother.
Active	El germà petit pinta el pare.	The little brother is face-painting Papa.
Passive	El germà petit és pessigollejat pel germà gran.	The little brother is tickled by the big brother.
Active	El germà gran pica el germà petit.	The big brother is hitting the little brother.
Passive	El germà gran és mossegat pel germà petit.	The big brother is bitten by the little brother.

Appendix D: Complete list of the sentences used on part III of Experiment 2 (Majorcan Catalan)

Female, long passive

sempentejar	activa	Sa nina gran sempenteja a sa nina petita.
examinar	activa	Sa nina gran examina a sa nina petita.
besar	passiva	Sa nina petita és besada de sa mare.
alimentar	passiva	Sa nina petita és alimentada de sa padrina.
rentar	activa	Sa mare renta a sa nina gran.
perseguir	passiva	Sa mare és perseguida de sa nina gran.
rapinyar	passiva	Sa nina gran és rapinyada de sa nina petita.
pentinar	activa	Sa mare pentina a sa padrina.
dibuixar	activa	Sa mare dibuixa a sa nina gran.
embrutar	passiva	Sa nina gran és embrutada de sa nina petita.
acariciar	activa	Sa nina petita acaricia a sa padrina.
sempentejar	passiva	Sa nina gran és sempentejada de sa nina petita.
examinar	passiva	Sa nina gran és examinada de sa nina petita.
besar	activa	Sa nina petita besa a sa mare.
alimentar	activa	Sa nina petita alimenta a sa padrina.
rentar	passiva	Sa mare és rentada de sa nina gran.
perseguir	activa	Sa mare persegueix a sa nina gran.
rapinyar	activa	Sa nina gran rapinya a sa nina petita.
pentinar	passiva	Sa mare és pentinada de sa padrina.
dibuixar	passiva	Sa mare és dibuixada de sa nina gran.
embrutar	activa	Sa nina gran embruta a sa nina petita.
acariciar	passiva	Sa nina petita és acariciada de sa padrina.

Female, short passive

sempentejar	activa	Sa germana petita sempenteja a sa germana gran.
examinar	activa	Sa germana petita examina a sa germana gran.
besar	passiva	Sa mare és besada.
alimentar	passiva	Sa padrina és alimentada.
rentar	activa	Sa germana gran renta a sa mare.
perseguir	passiva	Sa germana gran és perseguida.
rapinyar	passiva	Sa germana petita és rapinyada.
pentinar	activa	Sa padrina pentina a sa mare.

dibuixar	activa	Sa germana gran dibuixa a sa mare.
embrutar	passiva	Sa hermana petita és embrutada.
acariciar	activa	Sa padrina acaricia a sa germana petita.
sempentejar	passiva	Sa germana gran és sempentejada.
examinar	passiva	Sa germana petita és examinada.
besar	activa	Sa mare besa a sa germana petita.
alimentar	activa	Sa padrina alimenta a sa germana petita.
rentar	passiva	Sa germana gran és rentada.
perseguir	activa	Sa germana gran persegueix a sa mare.
rapinyar	activa	Sa germana petita rapinya a sa germana gran.
pentinar	passiva	Sa padrina és pentinada.
dibuixar	passiva	Sa germana gran és dibuixada.
embrutar	activa	Sa germana petita embruta a sa germana gran.
acariciar	passiva	Sa padrina és acariciada.

Male, long passive

abraçar	activa	Es nin petit abraça an es padrí.
eixugar	activa	Es nin gran eixuga a son pare.
tapar	passiva	Es nin petit és tapat de son pare.
dur	activa	Es nin gran du an es nin petit.
estirar	passiva	Son pare és estirat des nin gran.
afaitar	activa	Es padrí afaita a son pare.
fotografiar	passiva	Es padrí és fotografiat des nin gran.
pintar	passiva	Es nin petit és pintat de son pare.
fer pessigolles	activa	Es nin petit fa pessigolles an es nin gran.
pegar	passiva	Es nin gran és pegat des nin petit.
mossegar	activa	Es nin gran mossega an es nin petit.
abraçar	passiva	Es nin petit és abraçat des padrí.
eixugar	passiva	Es nin gran és eixugat de son pare.
tapar	activa	Es nin petit tapa a son pare.
dur	passiva	Es nin gran és duit des nin petit.
estirar	activa	Son pare estira es nin gran.
afaitar	passiva	Es padrí és afaitat de son pare.
fotografiar	activa	Es padrí fotografía an es nin gran.
pintar	activa	Es nin petit pinta a son pare.
fer pessigolles	passiva	Es nin petit és pessigollejat des nin gran.
pegar	activa	Es nin gran pega an es nin petit.

mossegar	passiva	Es nin gran és mossegat des nin petit.

Male, short passive

abraçar	activa	Es padri abraça an es germà petit.
eixugar	activa	Son pare eixuga a es germà gran.
tapar	passiva	Son pare és tapat.
dur	activa	Es germà petit du a me-coll an es germà gran.
estirar	passiva	Es germà gran és estirat.
afaitar	activa	Son pare afaita an es padrí.
fotografiar	passiva	Es germá gran és fotografiat.
pintar	passiva	Son pare és pintat.
fer pessigolles	activa	Es germà gran fa pessigolles an es germà petit.
pegar	passiva	Es germà petit és pegat.
mossegar	activa	Es germà petit mossega an es germà gran.
abraçar	passiva	Es padrí és abraçat.
eixugar	passiva	Son pare és eixugat.
tapar	activa	Son pare tapa an es germà petit.
dur	passiva	Es germà petit és duit a me-coll.
estirar	activa	Es germà gran estira a son pare.
afaitar	passiva	Son pare és afaitat.
fotografiar	activa	Es germà gran fotografía an es padrí.
pintar	activa	Son pare pinta an es germà petit.
fer pessigolles	passiva	Es germà gran és pessigollejat.
pegar	activa	Es germà petit pega an es germà gran.
mossegar	passiva	Es germà petit és mossegat.

Appendix E: Complete list of the sentences used on part III of Experiment 3

Ésser (To be)	L'avi és afaitat.	The grandfather is shaved.
Ésser (To be)	El germà petit és tapat.	The little brother is covered.
Estar (To be)	El germà gran està eixugat.	The big brother is dried.
Ésser (To be)	El germà petit és pintat.	The little brother is painted.
Estar (To be)	L'avi està afeitat.	The grandfather is shaven.
Estar (To be)	El germà petit està tapat.	The little brother is covered.
Ésser (To be)	El germà gran és eixugat .	The big brother is dried.
Estar (To be)	El germà petit està pintat.	The little brother is painted.
Estar (To be)	La germana petita està alimentada.	The little sister is fed.
Ésser (To be)	La mare és rentada.	The mother is washed.
Ésser (To be)	La mare és pentinada.	The mother is combed.
Estar (To be)	La germana gran està dibuixada.	The big sister is drawn.
Ésser (To be)	La germana petita és alimentada.	The little sister is fed.
Estar (To be)	La mare està rentada.	The mother is washed.
Estar (To be)	La mare està pentinada.	The mother is combed.
Ésser (To be)	La germana gran és dibuixada.	The big sister is drawn.