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Aspects of the acquisition of object control and ECM-Type verbs in European Portuguese

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ABSTRACT

We investigate the acquisition of sentential complementation under causative, perception, and object control verbs in European Portuguese, a language rich in complement types, including the typologically marked inflected infinitives. We tested 58 children between 3 and 5 years of age and 24 adults on a sentence completion task. The results support two main hypotheses concerning children's initial biases in representing complement structure. The first pertains to argument structure—a verb selects only one internal (propositional) argument (*Single Argument Selection Hypothesis*), the other to syntactic structure—propositional complements are complete functional complements (*Complete Functional Complement Hypothesis*). These initial biases lead children to avoid raising-to-object and object control structures, in favor of finite complements and inflected infinitive complements, the latter appearing in both target and nontarget contexts.

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1. Introduction

In this article we explore the child's acquisition of sentential complements, focusing in particular on infinitival complements of various sorts. There has been a great deal of research into aspects of language development that crucially depend on children having knowledge of complementation structures, but surprisingly little work has been done on the development of complements per se.¹ We view our study as a largely exploratory investigation into this central (but neglected) area of linguistic knowledge. We focus on complement acquisition in European Portuguese, a language that is rich in complement types, including the well-known, but typologically unusual, inflected infinitive.

Few would doubt that recursion is a defining characteristic of human grammars, the function responsible for limitless expressive power. We assume that the property of recursion (discrete infinity) is not itself learned but a core component of the biologically determined language faculty (what Hauser, Chomsky & Fitch 2010 call the FLN, faculty of language—narrow sense, that is, the computational component of language).² But languages vary in their inventories of complement types (finite indicative/subjunctive, bare, (un)inflected infinitives, small clauses, and so on). Also, within languages verbs clearly differ with respect to the particular complements they select. So while recursion is a UG property, there is still much learning that takes place in this domain.

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¹Some notable exceptions include Limber (1973); Bloom, Tackeff & Lahey (1984); Hyams (1984, 1985); and more recently, Landau & Thornton (2011). Each of these papers discusses aspects of the acquisition of complementation. However, they are all based on very small samples of spontaneous production data, and with the exception of Landau & Thornton, the data are not quantified and are largely impressionistic. We discuss the proposals in Landau & Thornton in more detail in the following. There is also work specifically on the acquisition of control (namely C. Chomsky 1969; Goodluck 1981; McDaniel, Cairns & Hsu 1990, a.o.) and raising (Becker 2005, 2006; Hirsch, Orfitelli & Wexler 2008; Kirby 2011; Orfitelli 2012a, 2012b), which we will review later in this section.

²Indeed, Hauser, Chomsky & Fitch (2010) argue that the FLN, and recursion in particular, is the only uniquely human component of language, separating it from other animal communication systems.

Interestingly, several approaches to language acquisition center on children's (prior) knowledge of the complementation patterns associated with particular verb classes. Syntactic bootstrapping (Gleitman 1990) is a case in point. In this kind of bootstrapping (as distinct from semantic bootstrapping) children use their knowledge of the syntactic frames of a verb to infer aspects of its meaning. Papafragou, Cassidy & Gleitman (2007) suggest that information about sentential complementation is especially helpful in the learning of mental verbs such as *think*, *know*, *believe*, etc., whose meaning is not easily inferable from nonlinguistic context. Thus, to the extent that mental and perceptual contents are not open to inspection, the learning burden falls more heavily on internal linguistic evidence, complement structure in particular.

Just as the syntactic bootstrapping hypothesis holds that verb complements, especially sentential arguments, are crucial to word learning, there are proposals that complement acquisition is critically important to theory of mind (ToM) development. Jill de Villiers et al. (Villiers 2000; Villiers & de Villiers 2000; Villiers & Pyers, 1997) argue that sentential complements are a necessary prerequisite to the child's acquisition of a representational theory of mind. This is because the syntax and semantics of sentential complements allow for the explicit representation of a falsely embedded proposition and are therefore uniquely suited to illustrate contradictions between mental states and reality. Various studies have demonstrated a significant correlation between children's knowledge of sentential complements and performance on theory of mind tasks (e.g., Villiers & Pyers 1997; Tager-Flusberg 1997, 2000; Hale & Tager-Flusberg 2003).

There is also a long tradition of research into children's interpretation of control in infinitival complements (C. Chomsky 1969; Goodluck 1981; McDaniel, Cairns & Hsu 1990; among others [a. o.]) and also significant work on extraction from embedded clauses, both A-movement/raising (Becker 2005, 2006; Hirsch, Orfitelli & Wexler 2008; Kirby 2011; Orfitelli 2012a, 2012b) and A'/wh movement and constraints thereof (Villiers, Roeper & Vainikka 1990; Villiers & Roeper 1995; Thornton 1990; among others). Performance on control and long-distance movement tasks clearly implicates a representation of clausal complement structure, even though the representation of clausal complement structure is not the main focus of these studies. Most relevant to the ensuing discussion is the finding by McDaniel, Cairns & Hsu (1991) that only 2 of the 20 children they tested (ages 3;09–5;04) on object control *tell* sentences (e.g., *Grover told Ernie to jump over the fence*) allowed both subject and object control of PRO; all the others had the more restrictive adult interpretation. McDaniel et al. propose that the two nontargetlike children have an arbitrary interpretation of PRO and a nontarget representation of the subordinated structure, hence no control on PRO (following ideas of Tavakolian 1981). In general, however, control into complement clauses (in contrast to adjunct clauses) seems unproblematic.³ We return to this issue later.

Becker (2005, 2006) addresses the learnability of complement selection more directly and specifically the problem of how children come to distinguish subject control (SC) versus raising to subject (RTS) verbs. Becker observes that the well-known string identity associated with control/raising verbs, shown in (1), poses a serious learning problem.

- (1) a. Janine tends [t to eat sushi]. (raising to subject)
 b. Janine likes [PRO to eat sushi]. (subject control)

Becker's first point is that there is no "control bias," which is to say that despite the availability of positive evidence in the form of expletive subjects for the raising case (e.g., *There tend to be storms this time of the year* versus **There try to be storms this time of the year*), children do not initially entertain a control analysis of all verbs. Rather, she argues, children use multiple probabilistic cues to decide whether a verb is raising or control, including expletive subjects (raising yes/control no),

³Eisenberg & Cairns (1994) found about 10% error rate in which children allowed an unmentioned NP to be the referent of PRO in subject control clauses under *want* and *try*. This contrasts with the roughly 77% correct unmentioned NP responses under *say* (e.g., *Mary says to sing*). See also Goodluck, Terzi & Díaz (2001), who find similarly good results on subject control in Spanish and Greek 4–7-year-olds.

animacy of the matrix subject (animate preferred for control/inanimate for raising), eventivity of the embedded verb (eventive preferred for control/stative for raising), occurrence in monoclausal structures (control yes/raising no) (see also Becker, 2014). She shows further that the 43 children (ages 3–5) in her study perform better on raising (*seem*, *appear*) than on control (*want*, *try*) in a modified grammaticality judgment task.⁴

In a similar vein, Kirby (2011) focuses on the learning problem associated with object control (OC) versus raising to object (RtO), which also show string identity, as illustrated in (2).

- (2) a. Janine wanted Paul [*t* to eat sushi]. (raising to object)
 b. Janine asked Paul [PRO to eat sushi] (object control)

Kirby argues that because RtO verbs select (theta mark) a single internal argument (sentential), they impose a lighter cognitive load than OC verbs, which select (theta mark) two internal arguments (an NP and sentential argument). According to Kirby, RtO is therefore easier for young children and represents the default case. We return to Kirby’s “cognitive load hypothesis” later.

Landau & Thornton (2011) present a case study of one child’s acquisition of the verb *want*. They too address the string identity problem in an indirect way. They note that the child first masters control with *want* and then RtO, hence a result that goes counter to Kirby’s predictions. Landau & Thornton propose that children initially avoid defective structures such as that involved in RtO and prefer instead a full CP complement.⁵

As we will see, the “string identity problem” exists for children acquiring European Portuguese as well and in general presents a clear challenge to the language learner. But there are other problems associated with learning complement selection. First, languages vary with respect to the type of complements they permit, and second, within a language a verb may select for multiple complement types, and verbs clearly differ in their complement choices (even within a particular verb class such as RtS). For instance, even though both *seem* and *tend* select for nonfinite RtS complements, only *seem* selects for a finite complement. The mapping between the meaning of a verb and the range of complement types it selects is neither one-to-one nor trivial. We refer to this as the “multiple frames problem.” It is possible of course that children deal with the multiple frames problem by using a “sit and wait” strategy: in other words, a conservative learning approach according to which the child only productively uses a particular (complement) structure once he has clear evidence for it in the input (Snyder 2011). It is equally possible that the child comes to the task with certain biases or unmarked assumptions, for example, a default raising analysis, as Kirby proposes, or an initial preference for CPs over defective structures as proposed by Landau & Thornton. Additionally, he may prefer certain complement types over others because of independent constraints—for example, an inability to form A-chains (Borer & Wexler 1987) would imply that children acquire control before raising (as also noted by Becker 2006).⁶

The goal of this article is to address these issues in the context of the acquisition of European Portuguese, a language that is rich in complement types and that illustrates well the two learning problems outlined. The children in our study performed an elicited production task (and we also looked at spontaneous production). This methodology allows us to see the child’s preferences. In this respect it contrasts with many of the comprehension and production studies discussed previously that probe children’s interpretation of sentence types such as raising and control. The central role that recursion, hence sentential complementation, plays in human language, and the decades of

⁴But see Hirsch, Orfitelli & Wexler (HOW) (2007) and Orfitelli (2012a, 2012b) for an opposing view and critique of Becker’s experimental task. HOW find that the children in their study often misconstrued raising sentences with *seem* (e.g., *Ken seems [to Barbie] to be wearing a hat*) as meaning roughly ‘Ken thinks to be wearing a hat’ or ‘Ken thinks Barbie is wearing a hat’. In other words, they assign the matrix verb an external argument, as if a control verb.

⁵See Hyams (1985) for a similar proposal.

⁶On the assumption that control is movement, as proposed in Hornstein (1999) and elsewhere, there would be an entirely different set of predictions.

research into the acquisition of control into, and movement out of, complement clauses, makes the development of complementation an important topic to investigate in its own right.

In the section that follows we discuss the syntax of sentential complementation in European Portuguese (EP). We then review some previous acquisition literature that informs our study (section 3) and briefly discuss the spontaneous production of the structures of interest (section 4). Finally, in section 5 we turn to our experimental study.

2. Complementation in European Portuguese

In this section we describe the properties of two groups of EP verbs: object control and perception and causative verbs. Perception and causative verbs form a syntactic class distinguishable from object control by the number of internal arguments selected in the context of infinitival complementation: one argument in the case of perception and causative verbs; two arguments in the case of object control verbs. The different argument structures will be discussed in section 2.1. Section 2.2 shows how object control and perception and causative verbs illustrate the two learnability problems mentioned in the previous section: the string identity problem and the multiple frames problem.

2.1. Complementation with EP object control, perception, and causative verbs

2.1.1. Object control verbs

In EP, object control verbs select for an object DP complement and an uninflected infinitival complement introduced by a preposition:

- (3) O Manuel ensinou os meninos a nadar.
 the Manuel taught the kids PREP swim.INF
 ‘Manuel taught the kids to swim.’

In this construction, the second DP—*os meninos* (‘the kids’) in (3)—is marked for accusative Case and when pronominalized, cliticizes onto the matrix verb, as in (4):

- (4) O Manuel ensinou-os a nadar.
 the Manuel taught-themCL.Acc PREP swim.INF
 ‘Manuel taught them to swim.’

Although the canonical object control structure requires the uninflected infinitive in its complement (3, 4), EP speakers generally also allow an inflected infinitive, as in (5). In this case as well the second DP is marked for accusative:

- (5) O Manuel ensinou-os a nadarem.
 he Manuel taught-themCL.Acc to swim.INF.3PL

The object DP and the infinitival complement form two separate constituents, that is, object control verbs select for two internal arguments. Thus, the DP and the infinitival complement cannot be clefted as a whole (6a); on the contrary, each one of the arguments may be independently clefted (6b, 6c):⁷

- (6) a. *Os meninos a nadar(em) é que ele ensinou.
 the kids PREP swim.INF(.3PL) is that he taught
 b. Os meninos é que ele ensinou a nadar(em).
 the kids is that he taught PREP swim.INF(.3PL)
 c. A nadar(em) é que ele ensinou os meninos.
 PREP swim.INF(.3PL) is that he taught the kids

⁷For these properties in EP, see Raposo (1989).

In addition, because they are two independent arguments, the DP plus the prepositional infinitival complement cannot constitute the answer to an object question (7):

- (7) Q: Sabes o que ele ensinou?
 know.2SG what he taught
 A: *Os filhos a nadar(em).
 the children PREP swim.INF(.3PL)

The sentential structure associated with object control verbs is schematized in (8), where the subject of the infinitival complement corresponds to a controlled empty category:⁸

- (8) DP V [DP] [_{PP} a /de_{PREP}] [_{CP/TP} PRO/pro VP]

2.1.2. Perception and causative verbs

Perception and causative verbs also select for infinitival complements. However, they occur in different structures than shown in (8). First, these two classes of verbs select for a single internal argument that may be either an uninflected (9) or inflected (10) infinitive; second, the complement does not contain a preposition.

- (9) a. A mãe viu os miúdos comer bolos.
 the mother saw the kids eat.INF cakes
 ‘Mommy saw the kids eat(ing) cakes.’
 b. A mãe deixou os miúdos comer bolos.
 the mother let the kids eat.INF cakes
 ‘Mommy let the kids eat cakes.’
 (10) a. A mãe viu os miúdos comerem bolos.
 the mother saw the kids eat.INF.3PL cakes
 ‘Mommy saw the kids eat(ing) cakes.’
 b. A mãe deixou os miúdos comerem bolos.
 the mother let the kids eat.INF.3PL cakes
 ‘Mommy let the kids eat cakes.’

In (9), the embedded subject is accusative, as shown in (11a), in which the pronoun subject takes the form of an accusative clitic (the nominative pronoun is illicit in this context [11b]).

- (11) a. A mãe viu-os / deixou-os comer bolos.
 the mother saw-CL.Acc let.CL.Acc eat.INF cakes
 ‘Mommy saw / let them eating / eat cakes.’
 b. *A mãe viu eles / deixou eles comer bolos.
 the mother saw they let they eat.INF cakes

N. Chomsky (1981) identifies sentences like the one in (11a) as involving exceptional case marking (ECM), a structure in which the embedded subject does not get its Case within its own clause; rather the matrix verb assigns accusative Case to this DP. However, there is no clear consensus on the ECM analysis. In fact, Postal (1974), Raposo (1981), Lasnik & Saito (1991), and Chomsky himself (N. Chomsky 2008), claim that the DP raises to the relevant object position of the main clause in order to get (accusative) Case, a construction known as Raising-to-Object (RtO).

⁸We leave open the debate concerning the CP/TP nature of the infinitival complement, as this is not central to the discussion in this article. The reference of the embedded null subject is controlled by the matrix object both with inflected and uninflected infinitive. We will not discuss here the nature of this empty category in the object control construction with inflected infinitive, but we hypothesize that a controlled *pro* is possible, in line with Raposo (1989), Barbosa & Cochofel (2005), and Modesto (2011).

The fact that actives and passives embedded under “ECM” verbs are synonymous (that is, truth-conditionally equivalent) shows that the embedded DP is generated as the logical subject of the lower clause (Rosenbaum 1967)—see (12a) and (12b):⁹

- (12) a. Deixei / vi o João convencer o Paulo.
 let.1SG / saw.1SG the João convince.INF the Paulo
 ‘I let João convince / saw João convince Paulo.’
- b. Deixei / vi o Paulo ser convencido pelo João.
 let.1SG / saw.1SG the Paulo be.INF convinced by.the João
 ‘I let / saw Paulo be convinced by João.’

However, there is also evidence that under perception and causative verbs the embedded DP is not the syntactic subject of the infinitival complement. In particular, this complement cannot be clefted as a whole, which suggests that the DP has been raised out of it (13):

- (13) a. *[Os meninos sair de casa] é que ele viu.
 the children leave.INF PREP home is that he saw
- b. *[Os meninos sair de casa] é que ele deixou.
 the children go.out from home is that he let

We therefore assume that the uninflected infinitival complements to perception and causative verbs involve RtO. The structure we assume for RtO is presented in (14), where the infinitival complement corresponds to a TP that is defective with respect to phi-features and Case (Gonçalves 1999, and to some extent Pires 2006):¹⁰

- (14) DP V [DP]_i [_{TPdef} ~~DP~~_i VP]

In the inflected infinitival complements illustrated in (10), the DP inside the embedded domain is marked with Nominative, behaving like a subject (see [15], where this subject takes the form of a nominative pronoun).

- (15) A mãe viu / deixou eles comerem bolos.
 the mother saw / let they eat.INF.3PL cakes
 ‘Mommy saw / let them eat(ing) / eat cakes.’

We argue that in this case the infinitival complement corresponds to a full CP or, at least, to a nondefective TP; in fact, there is some discussion concerning the CP/TP nature of inflected infinitives (see Raposo 1987; Madeira 1994; Duarte, Gonçalves & Santos 2012; a.o.), but this is not central here; in either case, what is crucial is that T is nondefective. The simplified structure of an inflected infinitive complement is represented in (16).

- (16) DP V [_{CP/TPnon-def} DP VP]

⁹Actually, as one reviewer remarked, not all passives are allowed, especially in the context of causative verbs:

(i) O João deixou a Maria ler o livro.
 the João let the Maria read.INF the book
 ‘João let Maria read the book.’

(ii) *O João deixou o livro ser lido pela Maria.
 the João let the book be.INF read by.the Maria

In fact, causative verbs impose selectional restrictions on the causee, which explains the ungrammaticality of (ii). Thus, the active/passive comparison only holds for the cases in which the selectional properties of both the matrix and the embedded verbs are satisfied.

¹⁰We are assuming that Case-valuation of the goal is related to the probe’s phi-features: “In the simplest case of two-membered probe-goal match (say [φ -features]-N), intrinsic features of the goal value those of the probe, and also value the structural Case feature of the goal (in a manner determined by the probe)” (N. Chomsky 2008:142).

Inflected infinitival complements (16) are thus similar in structure to finite complements, which can also be selected by perception (17a) and causative (17b) verbs (indicative with the former and subjunctive with the latter); in the case of perception verbs, the finite complement conveys indirect perception:

- (17) a. A mãe viu que a Maria lavou o carro.
 the mother saw that the Maria washed.IND the car
 ‘Mommy saw that Maria washed the car.’
 b. A mãe deixou que a Maria lavasse o carro.
 the mother let that the Maria washed.SUBJ the car
 ‘Mommy let Maria wash the car.’

Perception verbs like *ver* ‘see’ also select a different type of complement: the Prepositional Infinitival Construction, henceforth PIC (Raposo 1989). In this construction the infinitival domain may be inflected or uninflected and is headed by a preposition-like element—the aspectual marker *a* (Duarte 1993, Barbosa & Cochofel 2005), which is homophonous to the preposition *a* ‘to’:

- (18) O Manuel viu os meninos a nadar(em).
 the Manuel saw the kids ASP swim.INF(.3PL)
 ‘Manuel saw the kids swimming.’

Despite the inflection on the infinitive, in the PIC the DP *os meninos* ‘the kids’ is always marked with accusative, as the contrast in (19) shows:

- (19) a. O Manuel viu-os a nadar(em).
 the Manuel saw-themCL.Acc ASP swim.INF(.3PL)
 ‘Manuel saw them swimming.’
 b. *O Manuel viu eles a nadar(em).
 the Manuel saw they ASP swim.INF(.3PL)

The PIC counts as a single internal argument, with the DP and the *a*-infinitive forming one constituent. This contrasts with the object control construction, where the infinitival domain is also headed by a preposition but the structure contains two internal arguments. The claim that the PIC corresponds to a single constituent is empirically motivated by the following facts (see Raposo 1989, Duarte 1993):

- (i) The PIC can be clefted as a whole (cf. the object control sentence in [6]).

- (20) Os meninos a nadar(em) é que ele viu.
 the kids ASP swim.INF(.3PL) is that he saw
 ‘What he saw was the kids swimming.’

- (ii) The PIC can occur as the answer to an object question (cf. object control sentence in [7]).

- (21) Q: Sabes o que ele viu?
 know.2SG what he saw
 ‘Do you know what he saw?’
 A: Os filhos a nadar(em).
 the children ASP swim.INF(.3PL)
 ‘The children swimming.’

We assume that the PIC corresponds to a small clause whose predicate is headed by the aspectual marker *a*, with control also applying into the small clause, as the accusative marked lexical DP controls the null subject of the CP/TP complement (PRO/pro), as schematized in (22).¹¹

- (22) DP V [_{SC} DP [_{ASPP} *a*_{ASP} [_{CP/TP} PRO/pro VP]]

¹¹On the PRO/pro nature of the embedded null subject, see Raposo (1989) and Barbosa & Cochofel (2005).

This approach is also taken by Barbosa & Cochofel (2005), who follow Duarte (1993) in assuming that in perception verb contexts *a* is an aspectual marker instead of a true preposition. This aspectual marker assigns a progressive value to the construction; thus the *a*-INF complement denotes an ongoing situation in the time interval in which the matrix clause is located, and therefore the PIC involves direct perception.¹²

Finally, causative and perception verbs can occur in a complex predicate (the *faire*-Inf construction in Kayne's 1975 terms; see Gonçalves 1999 for complex predicates in EP), as illustrated in (23) and (24):

- (23) a. A mãe deixou saltar os miúdos.
 the mother let jump the kids
 'Mommy let the kids jump.'
- b. A mãe viu saltar os miúdos.
 the mother saw jump the kids
 'Mommy saw the kids jump(ing).'
- (24) A mãe deixou comer o gelado aos miúdos.
 the mother let eat the ice cream to.the kids
 'Mommy let the kids eat the ice cream.'

In the complex predicate construction, (i) the matrix and the embedded verbs are adjacent; (ii) only uninflected infinitives are allowed; (iii) the embedded subject occurs after the V-V string and if pronominal cliticizes onto the matrix verb, displaying the accusative or the dative case, depending on the class of the embedded verb (accusative with one-place predicates; dative with two-place predicates).

Summarizing this section:

- (i) Object control verbs select for two internal arguments: a DP object and an infinitival complement (with uninflected or inflected infinitive).
- (ii) Causative and perception verbs select for one internal (clausal) argument, which may be: (i) a finite complement; (ii) a bare inflected infinitival complement (with a nominative DP inside this complement); (iii) a bare uninflected infinitival complement (the RtO construction, where the embedded DP is accusative and cliticizes onto the matrix verb, or the complex predicate construction).
- (iii) Perception verbs also select for a small clause—the PIC construction, with either uninflected or inflected infinitive.

2.2. Learning problems in the acquisition of object control, perception, and causative verbs

Object control, perception, and causative verbs illustrate the two acquisition problems noted earlier: the string identity and the multiple frames problems.

The string identity problem arises when we compare object control and the PIC. In these cases, children have to deal with two superficially similar strings—V DP Prep VP:

- (25) a. O Manuel ensinou os **meninos** a **nadar**.
 the Manuel taught the kids PREP swim.INF
 'Manuel taught the kids to swim.'
- b. O Manuel viu **os meninos** a **nadar**.
 the Manuel saw the kids ASP swim.INF
 'Manuel saw the kids swimming.'

¹²Again, we leave open the debate concerning the CP/TP nature of the infinitival complement, as this is not central to the discussion in this article.

As we showed in the previous section, the surface similarity in (25) belies their different structures, depicted in (26):

- (26) a. DP V [DP] [_{PP} *a* /*de*_{PREP} [_{CP/TP} PRO/*pro* VP]]
 b. DP V [_{SC} DP [_{ASPP} *a*_{ASP} [_{CP/TP} PRO/*pro* VP]]

Perception and causative verbs also give rise to string identity as shown in (27):

- (27) a. A Ana ouviu **o menino** cantar.
 the Ana heard the child sing.INF
 ‘Ana heard the child sing(ing).’
 b. A Ana mandou **o menino** cantar.¹³
 the Ana made the child sing.INF
 ‘Ana made the child sing.’

The fact that the inflected infinitive lacks visible morphology for third person singular in sentences like (27) makes it impossible to determine whether the infinitive is uninflected or inflected and therefore to decide whether it corresponds to the RtO structure in (28a) or the structure in (28b).

- (28) a. DP V [DP]_i [_{TPdef} ~~DP~~_i VP]
 b. DP V [_{CP/TPnon-def} DP VP]

Notice that in such cases, the embedded DP may be replaced either by an accusative pronoun, as in (29) (the RtO case [28a]) or by a nominative pronoun, as in (30) (the inflected infinitive case [28b]):

- (29) a. A Ana ouviu-o cantar.
 the Ana heard-CL.Acc sing
 ‘Ana heard him sing(ing).’
 b. A Ana mandou-o cantar.
 the Ana made-CL.Acc sing
 ‘Ana made him sing.’
 (30) a. A Ana ouviu ele cantar.
 the Ana heard he sing
 ‘Ana heard him sing(ing).’
 b. A Ana mandou ele cantar.
 the Ana made he sing
 ‘Ana made him sing.’

The second problem that perception and causative verbs raise for the acquisition of complementation is that they select for a wide range of complements—the multiple frames problem. As shown in the previous section, in addition to the infinitival complements (inflected infinitive complements, RtO complements, complex predicates, and PIC under perception verbs), they also select for finite complements. This will be explored in the next section.

3. The acquisition problem for portuguese complements: Hypotheses

In the previous section, we saw how European Portuguese RtO verbs and object control verbs give rise to both the string identity problem and the multiple frames problem. In general the child must determine which complements are possible with which verbs in a particular language. In the EP case

¹³The meaning of the verb *mandar* is close to English (noncausative) *order*. In EP, this is a causative verb, in the sense that a relation cause-effect between the matrix and the embedded infinitival domain is established, that is, someone (denoted by the matrix subject) causes another one (the embedded logical subject—the causee) to do something (the situation described by the infinitive). The causative interpretation corresponds to the English causative *make*.

in particular the number of possible structures is increased as a result of the availability of inflected infinitive clauses.

The learning task for a child faced with a novel verb in a string of the form in (31) is to map this string into one of two different argument structures, represented in (31a) and (31b) in a very simplified way (namely, abstracting from the presence of a preposition or a homophonous aspectual marker—see [26]).

- (31) V DP VP
 a. V [DP] [VP] (ditransitive control verbs)
 b. V [DP VP] (RtO / PIC / Inflected Infinitive clause)

The structure in (31a), the double internal argument structure, corresponds to an (object) control structure (with either the uninflected infinitive and a controlled PRO, the canonical control case, or with the inflected infinitive and a controlled *pro*). The structure in (31b) corresponds to a case in which the verb selects for a single internal argument. This case may correspond to different derivations in EP: RtO (see [14]), PIC (a possibility restricted to perception verbs) (as in [22]) or a CP/TP inflected infinitive clause with a nominative subject (see the representation of the structure in [16]).¹⁴

So the question is, does the child have an initial hypothesis about such structures: Will he first assign strings of the sort in (31) a raising, control, or an inflected infinitive analysis? The raising versus control question is posed by Becker (2005, 2006, 2009) for subject control and RtS, and Kirby (2011) for object control and RtO in English. Both Becker (2009) and Kirby (2011) suggest that raising is not problematic for children. Kirby suggests that raising is an “initial” default.

This question about the child’s initial hypothesis is linked to another one: At which point in development is the child able to analyze a raising or a control structure? This is an issue that has been widely addressed in the literature (e.g., McDaniel & Cairns 1990; Cairns et al. 1994; Borer & Wexler 1987; Wexler, 2004; Hirsch & Wexler 2007; Hirsch, Orfitelli & Wexler 2007, 2008; Landau & Thornton 2011; Orfitelli 2012a, 2012b).

Arguments have been proposed in favor of both a “raising first” hypothesis and a “control first” hypothesis. Hirsch & Wexler (2007), Hirsch, Orfitelli & Wexler (2008), and, under different assumptions, Landau & Thornton (2011) suggest that control is acquired earlier than raising.¹⁵ Hirsch & Wexler (2007) and Hirsch, Orfitelli & Wexler (2007, 2008) propose an explanation of children’s difficulties with raising to subject with *seem* in terms of Wexler’s (2004) Universal Phase Requirement (UPR). According to this analysis, the *v* of matrix verb *seem* is defective in the adult grammar and therefore does not define a phase. Thus, the subject of the complement to *seem* can raise to matrix Spec, T. Children’s grammars, on the other hand, are constrained by the UPR, which specifies that *v* (whether defective or not) defines a phase, thereby blocking RtS in *seem* sentences.¹⁶

Landau & Thornton (2011) analyze the development of the complements of *want* in the grammar of one child (based on diary data). They find that *want* emerges later in structures that they analyze as RtO (32b) than in the subject control structure (32a) with the same verb.¹⁷

¹⁴Of course, in the case of RtO the DP raises to the matrix clause, thus (31b), which is intended to show the number of arguments, represents the structure before raising.

¹⁵Another related question focuses on the role of the experiencer phrase in the acquisition of raising structures. Orfitelli (2012b) compares children’s performance on *seem* sentences with their performance on sentences with other raising predicates (e.g., *tend*, *be about to*, *be going to*) that do not take an experiencer phrase. She concludes that the existence of the experiencer phrase, whether phonologically present or absent, affects comprehension and gives rise to poorer results with *seem* than with *tend*, etc. This leads Orfitelli to argue that children do not have a problem with subject to subject raising per se; rather, they are unable to raise over an intervening argument overtly or covertly present in the structure (see also Hyams & Snyder 2005, 2006; Snyder & Hyams, 2015).

¹⁶The UPR allows subject raising from vP internal subject position, in contrast to former analyses such as Borer & Wexler (1987), who predicted that all A-movement is delayed.

¹⁷Whether *want* is an RtO verb or not is controversial (see discussion in, e.g., Pesetsky 1991). We do not take a position on this issue here but rather simply report the Landau & Thornton’s assumptions.

- (32) a. I want to see paper. (1;08,10) (Landau & Thornton 2011:926)
 b. I just want somebody to play with me. (2;05,02) (Landau & Thornton 2011:928)

They argue on this basis that children start by assuming that the complement of *want* is a CP and only later produce RtO, when they can truncate the embedded CP. Their central claim is that “more defective” complements are acquired later (an idea we also adopt under somewhat different assumptions—see the following).¹⁸

Interestingly, despite their different approaches, Hirsch et al. and Landau and Thornton both relate the late acquisition of raising to the “defectiveness” of a raising structure, although defining this defectiveness in very different ways.

The facts reported thus far suggest a general hypothesis that may be tested when eliciting complements of perception and causative verbs in Portuguese, namely, less-defective complements are more productive earlier. We will define a nondefective clausal complement as a “complete functional complement,” the definition of which is given in (33).

- (33) *Complete Functional Complement*: A complement clause whose subject values its structural Case feature through agreement with a probe inside the clause.

An inflected infinitive or a finite complement to a causative is a complete functional complement, but an RtO complement is not. Although the term “complete functional complement” may be reminiscent of N. Chomsky’s (1986) “Complete Functional Complex,” the notion is not exactly the same. Chomsky’s “Complete Functional Complex” is characterized as following: “the relevant feature is (...) the presence of a subject, hence of a ‘complete functional complex’ with all functional roles satisfied” (N. Chomsky 1986:15). In our case, the relevant property is not the satisfaction of functional roles but whether the features of the embedded subject are internally valued.¹⁹ Our hypothesis for child language is now stated in (34).

- (34) *Complete Functional Complement Hypothesis (CFC)*: Children prefer a complement clause which is a complete functional complement (defined in 33).

Returning to the control/raising debate, some authors have questioned the claim that children have difficulties with raising structures. Indeed, Becker (2009) and Kirby (2011) argue that children may misanalyze control structures as involving raising. Specifically with regard to RtO, Kirby suggests that the reason for the initial raising preference is that RtO verbs carry fewer internal theta-roles than object control verbs. If this is correct and there is an early preference for fewer theta-roles, children might prefer to categorize a verb as selecting a single internal argument. This is what we will call the “single argument selection hypothesis” (35).

- (35) *Single Argument Selection Hypothesis (SASH)*: Children will initially assume a verb selects a single internal argument, if the relevant syntactic structure can be generated by the child’s grammar.

¹⁸According to Landau & Thornton (2011), before acquiring RtO, the child produced *want* with a nonfinite complement containing a nonobligatorily controlled null subject, in exactly the discourse contexts that would require a RtO structure, as in (i).

(i) Context: Laura wanted mother to push her in the stroller.

Laura: I want __ push Laura. (1;07,19)

‘I want Mommy/you to push Laura’ Landau & Thornton (2011:921)

Landau & Thornton additionally propose that children first assume the complement to *want* is subjunctive. We return to this in section 6. We note also that facts such as the one in (i) are not completely surprising in light of previous literature. McDaniel & Cairns (1990:316), for instance, say “We consider our most important finding in this range of data to be that there is a stage, previously unattested as far as we know, during which children lack control.”

¹⁹Our definition of Complete Functional Complement also does not correspond to the idea of a phase (N. Chomsky 1998), because *v* would not qualify as a complete functional complement, even though it may be a phase. For discussion of the similarities between the notions of “complete functional complex” and “phase,” see Boeckx & Grohmann (2007). In addition, we assume that PRO has Null Case (N. Chomsky & Lasnik, 1993; Martin 2001) or no case at all.

SASH is a hypothesis about the child's initial analysis of verb argument structure. SASH will lead the child to map input such as (31) onto the structure in (31b) if his grammar has a way to derive (31b), namely if he can derive the DP in (31) as the subject of the embedded clause.

SASH will lead to errors with object control structures, while the CFC (34) will render RtO problematic in the initial stages. On the other hand, the inflected infinitive structure is predicted to be unproblematic.

The status of the PIC is less obvious. It is clearly consistent with SASH as it corresponds to the structure in (31b) (see the analysis of PIC as a small clause in [22]). But the external argument in the PIC small clause bears accusative Case when embedded under perception verbs (examples in [19]), which means it is not a CFC according to our definition.²⁰ However, PIC also occurs in root exclamative contexts (as in 36), either preceded or not by the imperative of a perception verb, and in these cases the subject of the small clause is nominative.²¹ It is thus possible that the child—faced with input of the sort in (36)—would analyze the PIC as a complete functional complement even when it occurs under perception verbs. In this case, we would expect it to be an early acquisition.

- (36) (Olha!) Os meninos / Eles a nadar(em)!
 (look!) the children they ASP swim.INF(.3PL)
 “(Look!) The children are swimming.”

In our study, described in the next sections, we do not pit raising and control structures against each other, and hence we do not directly test the “raising first/control first” hypotheses.²² Rather, in looking at a broader range of structures, our goal is to determine the extent to which early preferences for complete functional complements or for a single internal propositional argument may result in what descriptively looks like a preference for raising or for control. More generally, we are interested in understanding the child's initial preferences in the domain of complement structure because this may inform us as to what constitutes “complexity” for the learner. The CFC hypothesis and SASH are our best guess as to what structures children find simpler.²³

This study thus intends to address the following questions. When given a relevant discourse context:

- (i) Do children prefer complete functional complements?
 If so, they will prefer an inflected infinitive complement (or finite clause) over RtO as the complement to perception and causative verbs and will show no difficulties with object control structures.
- (ii) Do children prefer structures in which a verb selects for only a single (propositional) argument (according to the SASH)?
 If so, object control structures will be problematic.
- (iii) Do children adhere to both the CFC and SASH initially?
 If so, children will show a general preference for inflected infinitive complements where they are possible and will show difficulties both with RtO and object control.

²⁰In EP, all prepositions assign oblique case, not accusative (or nominative). Thus, even if the aspectual marker in the PIC was analyzed as a true preposition, it could not be the source of case in the DP.

²¹The cases of root PIC seem close to Root Infinitives (RIs) in adult languages. In Portuguese and other Romance languages, the RI subject is nominative (see i). So it is possible that the subject gets nominative in these root contexts by the same mechanisms RIs subjects get nominative.

(i) Eu comer polvo? Nunca.
 I eat.INF octopus never
 ‘Me eat octopus? Never.’

²²We also did not test raising to subject (RtS) verbs, and so our study does not speak to the subject raising versus subject control debate at all, though as we will see in the following children in our study have no difficulty producing subject control structures.

²³Alternatively, it might be that children find the complement types that adults are most likely to use to be the simplest to acquire or those that are typologically least marked (Jakobson 1968). We will see that neither of these hypotheses is supported by our data.

Before turning to our elicited production study, we briefly discuss some results from spontaneous speech. If Snyder (2011) is right and a delayed acquisition of a structure may result in avoidance of the structure in spontaneous production but not in errors of commission, we expect the most telling results to come from elicited production, where children's responses are partially structured for them. We have thus designed a production experiment to test these hypotheses, which we report in section 5. First, however, we briefly discuss children's spontaneous production of the verbs used in the experiment.

4. A Note on spontaneous production

We conducted a search in the spontaneous production corpus of Santos 2006, extended version. This corpus contains 27,586 child utterances produced by three children (1;06–3;11, 1;06–3;10, 1;05–2;09, MLUw 1.2–3.8) (67 files corresponding each to 45 to 50 minutes of child-adult interaction).

Looking first at the spontaneous production of control structures, we find that subject control is well attested. In the 27,586 utterances produced by children in the corpus, we found 224 occurrences of *querer* 'want' in subject control structures, as well as 31 occurrences of *conseguir* 'be able to'.²⁴ The data thus provide ample evidence of production of subject control. This contrasts sharply with object control. There is only one occurrence of *ensinar a* 'teach' and no occurrences of *proibir de* 'forbid' in child spontaneous production; *ensinar a* 'teach' also occurs in child-directed speech, contrary to *proibir de* 'forbid' (even though children may hear *proibido* 'forbidden' in structures such as *está proibido* 'is forbidden').²⁵ These facts may suggest that acquisition of the argument structure of *ensinar a* 'teach' is some steps ahead relative to the acquisition of *proibir*.

In the spontaneous production data, complements to perception and causatives verbs were also found. We found 39 occurrences of *ver* 'see': 5 had nonfinite complements, but no RtO cases were found.

In the case of causative verbs, we found 77 occurrences of *deixar* 'let' and two occurrences of *mandar* 'make.' *Mandar* 'make' occurs once with an omitted causee and in another case in an ambiguous structure compatible with an inflected infinitive analysis. The occurrences of *deixar* 'let' include 13 cases with an omitted causee and four clear cases of inflected infinitive, with a nominative pronoun as subject. They also include 53 cases with an accusative subject (37), which might be analyzed as cases of RtO. However, all these cases have a first-person singular accusative subject, and thus we believe that these cases might be frozen structures and not necessarily evidence for productive use of RtO.

(37) T: deixa me # pe(r)guntar quem é! (TOM 2;09,27)
 let me ask who is

Thus, the spontaneous production data we analyzed did not give us absolute evidence for RtO or for object control in the early stages, consistent with the predictions of SASH and CFC, under the assumption that "hard" structures are avoided in spontaneous production, as Snyder proposes. Still, the ultimate test will be to put the child in a position where he must produce something and to then ascertain what his preferences are. This we do in our elicited production study.

5. The experiment

In this section we report the results of an elicited production task in which the child is asked to help a puppet by completing the puppet's statement about a story that the experimenter acts out. We tested 58 children and 24 monolingual adult speakers of EP with no background in linguistics. Information on the subjects is provided in Table 1.

²⁴Some were elliptical structures.

²⁵According to our data, object control verbs in general are not very frequent in either child speech or child-directed speech.

Table 1. Subjects.

Age (in years)	Range (Mean)	Number
3	3;05–3;11 (3;08)	16
4	4;00–4;11 (4;05)	21
5	5;00–5;10 (5;05)	21
Adults	18–49 (24)	24

Table 2. Conditions.

Condition	Verb class	Verbs tested	Possible complements
1	Causative verbs	<i>mandar</i> 'make'; <i>deixar</i> 'let'	Finite (subjunctive) Inflected infinitive RtO Complex predicate
2	Perception verbs	<i>ver</i> 'see'	Finite (indicative) Inflected infinitive RtO PIC Complex predicate (only with embedded unergative or unaccusative verbs)
3	Object control verbs	<i>ensinar a</i> 'teach'; <i>proibir de</i> 'forbid'	Object control (uninflected infinitive) Object control (inflected infinitive) ²⁶
4	Subject control verbs (in subject control contexts)	<i>querer</i> 'want'; <i>conseguir</i> 'be able to'	Subject control (uninflected infinitive)
5	Subject control verbs (with disjoint reference of the main and the embedded subject in finite complements)	<i>querer</i> 'want'; <i>conseguir</i> 'be able to'	Finite (subjunctive)

All the child subjects included in the study were monolingual children exposed to EP with no previous report of language impairment (one child was excluded because his father was found to be a speaker of Brazilian Portuguese; eight other children were excluded because they did not complete the task). Data collection took place in a quiet room in the different kindergartens attended by the children. All the interviews were recorded, and children's answers were annotated during the session and transcribed.

The elicited production task was made up of a set of stories that the experimenter presented to both the child and to a "silly" puppet while acting them out with props. The stories consisted of several different situations, and the child was asked to help the puppet by completing what he says about what happened. The contexts were designed to elicit perception, causatives, and control verbs. These were the three experimental conditions. In addition, two control conditions were included: subject control verbs in permissible and impermissible subject control contexts. The five conditions are provided in Table 2, along with the verbs tested in each condition. The verbs were preferably selected from the set of verbs occurring in a corpus of child and child-directed speech (Santos, 2006, extended version).²⁷

In Conditions 3 to 5, two test items were included for each verb tested. In the case of Conditions 1 and 2, four items were included for each matrix verb: two items with an embedded transitive, one item with an embedded unaccusative, one item with an embedded unergative.²⁸ This results in 24 test items. The test also included two training items and 12 fillers. The uneven number of test items per verb in the different conditions was a function of the number of structures allowed in the complement of the different types of verbs (see Table 2). In conditions involving perception and

²⁶The verb *proibir* 'forbid' also accepts a finite subjunctive complement.

²⁷All the verbs except for *proibir* 'forbid' occur in child and/or child-directed speech between 1;05 and 3;11.

²⁸Perception and causative verbs present different restrictions on the formation of complex predicates: In the case of perception verbs, complex predicates with embedded transitive verbs are ruled out by most EP speakers, whereas the same restriction is not observed in the case of complements to causatives (Gonçalves 1999).

causative verbs, more items should give the children the opportunity to produce the wider variety of complement structures allowed by these verbs.

Conditions 1 to 3, targeting structures under causative and perception verbs and object control structures, directly allowed us to address the hypotheses laid out in the previous section. Specifically, Conditions 1 and 2 (causative and perception verbs, respectively) test the CFC; Condition 3 (object control verbs) tests SASH. The results of the two other conditions, which target subject control verbs in subject control contexts and contexts where control is not possible, will be compared to the results in the object control condition. This will allow us to determine whether children have problems with control in general or specific problems with object control structures.

In (38) we present an example of a test item from Condition 1 (causative verbs), followed by [Figure 1](#), showing the context for the item. In (39) we provide an item targeting a structure with a matrix perception verb (Condition 2). [Figure 2](#) represents the context for (39).



Figure 1. Context for the item in (38).



Figure 2. Context for the test item in (39).

(38) Example from Condition 1

Policeman: O meu carro não anda, preciso da vossa ajuda.
 the my car NEG works need.1sg Prep+the your help
 'My car doesn't work, I need your help.'

Big elephant: Eu sou grande e tenho muita força e os meus filhos são
 I am big and have a lot strength and the my kids are
 pequenos, mas também têm força. Vá, tem de ser!
 small But also have.3pl strength come on must PREP
 Empurrem. Vá, lá.
 be push come on

'I'm big and strong and my kids are small but they are strong too. Come on, it must be done. Push. Come on.'

Small elephants: Sim, pai, nós conseguimos.
 yes dad we can
 'Yes, dad, we can do it.'

Experimenter: O pai é que manda nos elefantezinhos.
 the father is that gives orders Prep+the little elephants
 'Dad is the one who tells the little elephants what to do.'

Puppet: **O pai mandou o quê? O pai ...**
 the father made what? The father ...

Target answers:

a. RtO

(O pai) mandou os elefantezinhos / mandou-os empurrar o carro.
 the father made the little elephants made CL.Acc push.INF the car

b. Complex predicate

(O pai) mandou empurrar o carro aos elefantezinhos.
 the father made push.INF the car to.the little elephants

c. Inflected infinitive complement

(O pai) mandou os elefantezinhos / eles empurrarem o carro.
 The father made the little elephants they push.INF.3PL the car

d. Finite complement (subjunctive)

(O pai) mandou que os elefantezinhos / eles empurrassem o carro.
 The father ordered that the little elephants they push.SUBJ.3PL the car

(39) Example from Condition 2

Situation: Two pigs push a shopping cart. A dog is watching the scene.

Experimenter: O cão viu o que aconteceu. Os porcos...
 the dog saw what happened. The pigs ...

Puppet: **O que é que o cão viu? O cão ...**
 what is that the dog saw? the dog
 'What did the dog see? The dog ...'

Target answers:

a. RtO

(O cão) viu os porcos / viu-os empurrar o carro de compras.
 the dog saw the pigs saw CL.Acc push.INF the shopping cart

b. PIC

(O cão) viu os porcos / viu-os a empurrar(em) o carro de compras.
 the dog saw the pigs saw CL.Acc ASP push.INF.(3PL) the shopping cart

- c. Inflected infinitive complement
 (O cão) viu os porcos / eles empurrarem o carro de compras.
 the dog saw the pigs / they push.INF.3PL the shopping cart
- d. Finite complement (indicative)
 (O cão) viu que os porcos empurraram o carro de compras.
 the dog saw that the pigs push.IND.3PL the shopping cart

In (40) we provide a test item with a matrix object control verb (Condition 3). In this case, the puppet's question does not contain the object control verb (even though the target verb is primed by the experimenter) for reasons that we make explicit.

(40) Example from Condition 3

- Little elephants: Oh, vá, nós queremos. É tão giro mergulhar.
 oh please we want is so fun dive
 'Oh please, we want it. Diving is fun.'
- Big elephant (dad): Não, estão proibidos.
 no are forbidden
 'No, you are forbidden.'
- Experimenter: O pai proibiu.
 the dad forbade
 'Dad forbade it.'
- Puppet: **O que é que o pai fez? O pai ...**
 what is that the dad did? the dad
 'What did dad do? Dad ...'

Target answers:

- a. Object control (uninflected infinitive)
 (O pai) proibiu os elefantes/ proibiu-os de mergulhar.
 the father forbade the elephants forbade them PREP dive.INF
- b. Object control (inflected infinitive)
 (O pai) proibiu os elefantes / proibiu-os de mergulharem.
 the father forbade the elephants forbade them PREP dive.INF.3PL

Two features of the test items should be highlighted. First, in all items the lower DP (e.g., *the pigs* in [39] or *the elephants* in [40]) is plural, making visible the contrast between inflected and uninflected infinitives (the third singular form of the inflected infinitive does not take overt inflection and is therefore indistinguishable from the uninflected infinitive). Second, the puppet's (eliciting) sentence only contains the matrix subject, not the verb. This was done in order to be able to also elicit structures containing clitics, such as (38a) or (39a), since the clitic would be clear evidence of accusative case.

Because only the matrix subject is provided, the targeted matrix verb had to be salient in the preceding discourse. In the case of causative and perception verbs (and also in the case of subject control verbs), the verb occurs in the puppet's question and thus primes an answer corresponding to a structure with a matrix causative or a matrix perception verb. In the case of object control verbs, this would not be an option because we wanted to elicit a clear object control structure, with both the DP complement and the infinitival complement; as shown in (7) (repeated for ease of exposition), the answer to an object question cannot contain both the DP and infinitival complements with an object control verb, precisely because these are two arguments (see [section 2.1.1.](#)).

- (41) b. Q: Sabes o que ele ensinou?
 know.2SG what he taught

A: *Os filhos a nadar(em).
 the children PREP swim.INF(.3PL)

In this case, the experimenter used the verb in order to prime it before the puppet asks a question, and the puppet's question, which was presented immediately after, contains the predicate *fazer* 'do,' which anaphorically recovers a predicate (see 40).

In the following section, we present the results of the experiment.

6. Results and discussion

We begin with the results of the two first conditions, which target matrix causative and perception verbs respectively and which most clearly illustrate the multiple frames problem (see the list of possible complements to causatives and perception verbs in Table 2). These conditions allowed us to specifically evaluate the CFC hypothesis (see 34). We then turn to the results obtained with object control verbs (section 6.3), which allow us to evaluate our second hypothesis, SASH (see 35). Finally, in section 6.4 we discuss children's performance in Conditions 4 and 5, as a means to compare children's performance in object control with their performance in other control structures. For ease of exposition, we discuss the results along with their presentation.

6.1. Causative verb target

Figure 3 shows the results for matrix causative verbs (Condition 1). The total number of test items presented to each group of speakers is indicated in the graph. The percentages represented in the graphs were calculated over this number (and knowing that the items received an answer in 97% to 100% of the cases). In the case of Condition 1, answers were coded according to their syntactic structure: inflected infinitive (INFL_INF) when an overtly inflected infinitive verb form was used, either with an overt nominative pronoun, a null subject, or a lexical DP subject; Raising-to-Object (RtO) when an uninflected infinitive was used with either an accusative pronoun or a lexical DP subject; infinitive with no causee (Inf_no_Causee) when an uninflected infinitive was used with no overt subject; complex predicate when the structure was compatible with such an analysis; finite clause with a subjunctive (Finite_SUBJ) when a target finite complement with subjunctive mood was used. All remaining cases were coded as Other, including sentences consisting of only the verb (e.g., *deixou* 'let.Past.3sg') or with no clausal complement, cases in which the child avoided the target verb and used another verb (e.g., *mandar* 'make' replaced by *dizer para* 'tell' or *chamar para* 'beckon'), or cases in which he repeats a part of the story but does not perform the intended sentence completion.

The results show that for all age groups except the 3-year-olds, the most frequent answer is the inflected infinitive (INFL_INF), illustrated in (42).²⁹ This is also the answer preferred by adults.

- (42) O pai mandou os outros tigres saírem da casota. (3;08,23)
 the father made the other tigers leave.INF.3PL of the kennel
 'The father made the other tigers leave the kennel.'

The 3-year-old group, and to a lesser extent the other child groups, also produce a structure that was not expected in the context: an uninflected infinitive without an overt Causee (Inf_no_Causee), illustrated in (43).

- (43) a. ... mandou dormir. (3;09,09)
 made sleep
 '... made someone sleep.'

²⁹In some of these cases, children insert the prepositional complementizer *para* 'for' introducing the inflected infinitive clause, which results in a nontarget structure (i). This is interesting in light of the fact that inflected infinitives were shown to first emerge in child spontaneous speech in purpose clauses introduced by *para* (Santos et al. 2013). Notice that in cases such as (i), we have an inflected infinitive and a nominative subject (nominative is visible in the pronominal subject), excluding an account in terms of case marking by the complementizer, similar to what was suggested for *want* in so-called ECM structures (N. Chomsky 1981 suggests case marking by an unpronounced complementizer *for*—see also discussion in Pesetsky 1991).

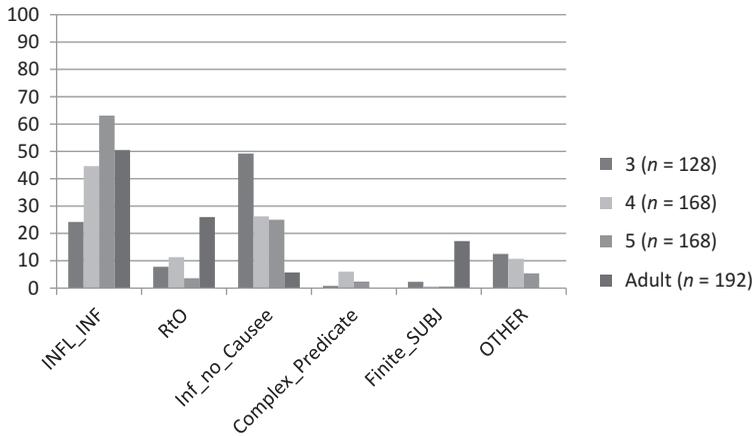


Figure 3. Results with matrix causative verbs (Condition 1).

- b. ... deixou comer a cenoura. (3;06,21)
 let eat the carrot
 ‘... let someone eat the carrot.’

A Kruskal-Wallis test confirms a general difference between the groups in the rate of production of this structure, $H(3) = 21.467$, $p < 0.001$ and a Mann-Whitney test shows that even at age 5 the children still produce significantly more Inf-no-causee than adults ($U = 160$, $p < 0.05$). When such a structure is produced in the adult grammar, it is generally interpreted with an arbitrary subject reading, but this was not the relevant reading in the context. It is true that some adults also produced this structure, though in much smaller proportion. Cases such as (43) could be analyzed as cases of object omission—an object omission stage has been observed in the acquisition of several languages (see Pérez-Leroux, Pirvulescu & Roberge 2008). In this case, the structure in (43) could be seen as an attempt to produce a RtO structure but with an omitted DP. However, the cases of object omission described in the literature target logical objects and not constituents generated as logical subjects—Pérez-Leroux, Pirvulescu & Roberge (2008) analyze these object omissions as null cognate objects. On the other hand, if object omission is seen as object clitic omission and attributed to a difficulty in producing accusative clitics, this would not explain why children do not produce RtO structures with a lexical DP subject (see 9, in section 2.1.2). We instead interpret these cases of omission in the complement of causatives as a result of a difficulty in valuing the Case feature of a DP in this syntactic environment. We return to the discussion of this structure later in section 7.

Another relevant result concerns the production of RtO in this condition, illustrated in (44). Even though some children, including 3-year-olds, do produce RtO, Figure 3 shows that the rates are very low in the child groups. Again, a Kruskal-Wallis test confirms a general difference between the groups in the rate of production of this structure, $H(3) = 17.202$, $p = .001$. A Mann-Whitney test shows that the difference between 4-year-olds (the group with the higher RtO rate) and adults is marginally significant ($U = 335.5$, $p = .049$).

- (44) a. ... mandou os filhos empurrar o carro do polícia. (3;10,21)
 made the children push the car of the policeman
 ‘... made the children push the policeman’s car.’
- b. O pai deixou-os sair da casa um bocadinho. (3;07,08)
 the father let-ACC.CL leave.INF of.the house a bit
 ‘The father let them leave the house for a while.’

- (i) O pai deixou para eles empurrarem o carrinho de compras. (4;5,17)
 the father let COMP they push.INF.3PL the shopping cart

It is worth noting that finite subjunctive complements are produced almost exclusively by the adult group, and complex predicates are hardly produced by any group.

Summarizing, child answers to Condition 1 show a clear preference for inflected infinitives and a general avoidance of RtO. Both these results are consistent with the CFC, namely, children show a preference for complements in which all argument features—including Case in the embedded subject DP—have been internally valued.

6.2. Perception verb target

Figure 4 presents the results for matrix perception verbs (Condition 2). The categories used to code these data were the same as in Condition 1, with the addition of the category PIC and the difference that in this condition finite clauses take indicative (Finite_IND). We coded as PIC all cases in which the complement corresponded to a small clause with the aspectual marker *a* (as described in section 2), whether the embedded infinitive is inflected or uninflected. The category Other groups all other answers, mostly sentences with no clausal complement or cases in which the child repeats a part of the story but does not perform the intended sentence completion.

The most striking results in this condition are (i) the clear preference for PIC by adults and (ii) the split between the PIC and finite clauses for the children. Examples of the PIC and finite clause responses are given in (45) and (46) respectively.

- (45) a. ... viu estes dois cavalos a dançarem. (3;08,23) PIC
 saw these two horses PREP dance.INF.3PL
 '... saw these two horses dancing.'
- b. O pai tigre viu os filhotes a cair. (3;09,12) PIC
 the father tiger saw the children ASP fall.INF
 'The father saw the children falling.'
- (46) ... viu que eles tinham comido o bife. (3;05,16) Finite
 saw that they had eaten the steak
 '... saw that they had eaten the steak.'

As noted earlier, finite complements under perception verbs must be indicative. This may be part of the reason why children produce finite complements with perception verbs but not with causative verbs (which take subjunctive). The rate of production of all the other structures, including RtO, is exceedingly low. As before, the answers subsumed under Other correspond to cases where the child avoided the verb or failed to provide a clausal complement, for example, the response in (47).

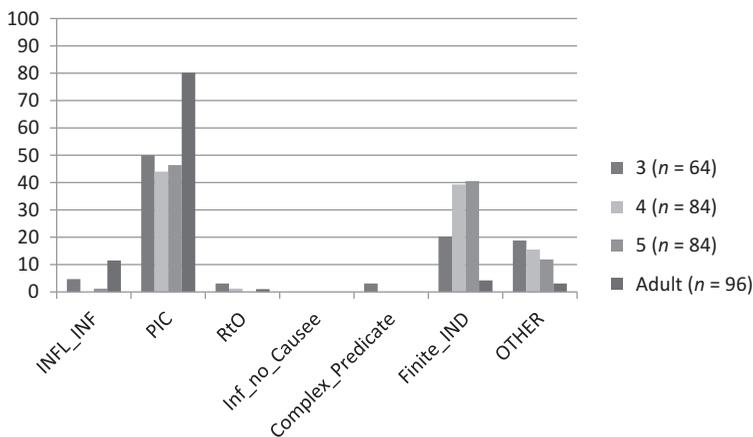


Figure 4. Results with matrix perception verbs (Condition 2).

- (47) ... viu os cavalos. (5;08,17)
saw the horses

Let us return to the PIC/finite complement split in the child data. As we see, adults produce almost exclusively PICs (80%). Children also produce PIC at high rates (40%–50%), but they also produce many finite complements (20%–40%), especially 4- and 5-year-olds. Can we find an explanation for this split in children and for the difference in adult and child behavior? Let's begin by recalling that the *a* in the PIC has been analyzed as an aspectual marker (Duarte 1993), generally related to progressive aspect (see section 2.1). Thus, the PIC in (48a) contrasts with the finite complement in (48b) precisely in its aspectual reading: whereas (48a) must mean that Pedro saw Paula as she was entering the house (the ongoing or “open” reading), (48b) has either an open or a “closed” reading denoting a terminated event, namely, Pedro saw that Paula was at home and therefore he inferred that she must have entered the house. The first involves direct perception of the event and the second indirect (inferential) evidence of the event (Rizzi 1992).

- (48) a. O Pedro viu a Paula a entrar em casa. PIC
the Pedro saw the Paula ASP enter PREP house
'Pedro saw Paula entering the house.'
- b. O Pedro viu que a Paula entrou em casa. Finite complement
the Pedro saw that the Paula entered PREP house
'Pedro saw that Paula entered the house.'

In the case of adults, PIC was generally preferred. PIC indeed corresponds to the most natural reading in the context, since in each context the entity denoted by the matrix subject actually witnessed the event. However, closer inspection of the child data shows that the PIC and finite complements are used with different test items, in the case of two child subgroups, 4- and 5-year-olds. In this condition there were four items, two of which targeted embedded atelic predicates (*empurrar o carro* ‘push the shopping cart’; *dançar* ‘dance’) and two telic predicates (*comer o bife* ‘eat the steak’; *cair* ‘fall’). Table 3 presents the number of PIC and finite responses for each aspectual category (telic/atelic) in each group of speakers.

We see that 3-year-olds produce the PIC with both telic and atelic predicates, and they seem to have an overall preference for the PIC. For the 4- and 5-year-olds there was a significant association between the telicity of the predicate and the type of structure they produced: Finite clauses were most often produced with telic predicates, whereas the PIC was most often used with atelic predicates—4-year-olds: $\chi^2(1) = 6.82, p < .05$; 5-year-olds: $\chi^2(1) = 4.87, p < .05$. We know that children are sensitive to aspectual distinctions at a very young age, and their use of tense/aspect morphology is in general conditioned by the telicity of the predicate more strongly than for adults (see Wagner 2001 for review of relevant literature). Here we seem to see something similar. Clause type (whether PIC or finite) is mapped more strictly onto event structure for the child than the adults, who show an overall preference for PIC. This aspectual mapping is confirmed by the tenses children used in the finite clause—mostly past tenses (*pretérito perfeito* [49a] or *pretérito mais-que-perfeito composto* [49b]).

- (49) a. O leão viu que os tigres comeram o bife todo. (4;01,01)
the lion saw that the tigers ate the steak all
'The lion saw that the tigers ate the entire steak.'
- b. ... viu que eles tinham caído. (4;02,14)
saw that they had fallen
'He saw that they had fallen.'

³⁰In the case of adult data, a Fisher's Exact test was performed, given the low expected counts in two of the cells.

Table 3. Child Use of PIC and Finite Complements with Telic and Atelic Embedded Predicates (Absolute Numbers).

	3-year-olds		4-year-olds		5-year-olds		Adults	
	PIC	Finite	PIC	Finite	PIC	Finite	PIC	Finite
Telic	17	7	12	21	14	21	37	2
Atelic	15	6	25	12	25	13	40	2
	(n.s.)		$(p < .05)$		$(p < .05)$		(n.s.) ³⁰	

Thus, the PIC is not problematic for children (it is preferred by 3-year-olds), but aspectual effects seem to override this preference for PIC in the case of older child groups.³¹ The fact that the PIC is unproblematic for children is not surprising in light of SASH because it consists of a single small clause. However, as we noted earlier, the status of these structures in terms of our CFC hypothesis is less clear: It is possible that children analyze the PIC under a perception verb as a CFC, i.e., as a small clause whose subject DP is licensed in the same way as it is licensed in PIC structures in root contexts (see [36] in section 3). This hypothesis is strongly supported by the fact that, with the exception of one 4-year-old child who produced two cases of a PIC with an accusative pronominal subject (50a), all the other cases of PIC with a pronominal subject (22 cases) produced by children in all the age groups have nominative subjects (50b)—not possible in the adult grammar in an embedded context. On the other hand, this also reinforces the idea that the problem for children is not moving the DP out of the embedded sentence but specifically performing an Agree operation involving phi-features in the embedded subject and some probe in the matrix clause—as suggested in section 2, as the PIC does not involve raising of the subject DP, in contrast to RtO structures.

- (50) a. (A zebra) viu-os a dançar. (4;08,09)
the zebra saw them.Acc ASP dance.INF
‘The zebra saw them dancing.’
- b. (A zebra) viu *eles* a dançar. (4;05,12)
the zebra saw they ASP dance.INF
‘The zebra saw them dancing.’

Summing up, the results in Condition 2, which elicited complements of perception verbs, show that children are split between PIC (the adult preferred choice) and finite indicative clauses, for aspectual reasons. However, the nontarget use of nominative pronouns in the subject of a PIC also suggests that they are not producing PIC as an ECM structure, contrasting with the adult norm. These results also show that RtO is not produced by either children or adults.

6.3. Object control target

The results for object control items (Condition 3) are presented in Figure 5. In this case, we coded the data according to the following categories: object control with uninflected infinitive (OC_UNINFL_INF) when the two arguments of the object control verb are produced and the clausal argument bears uninflected infinitive; object control with inflected infinitive (OC_INFL_INF), when the two arguments of the object control verb are produced and the clausal argument bears inflected infinitive; structure with one omitted argument, either the clausal argument or the DP argument (?OC_OMIT_ARG); finite subjunctive clause (Finite_SUBJ) when the complement of the verb is a finite subjunctive clause. We also coded as *INFL_INF cases in which the child produces the verb with a single complement, in this case an inflected infinitive clause—these cases

³¹It is possible that the younger children avoid the finite structure in favor of the PIC, not for grammatical reasons but because their powers of inference are still quite limited at that age. Children’s understanding of inference as a source of information is acquired after the age of 3 and is fully available only at the age of 6 (Sodian & Wimmer, 1987; Wimmer, Hogrefe & Perner 1988). Thus aspectual effects may come into play only after children have begun to make the inferences involved in indirect perceptual events.

are ungrammatical in the adult grammar. All remaining cases were coded as Other—these mainly include sentences in which the target verb was avoided and another verb was used (e.g., *proibir* ‘forbid’ replaced by *não deixar* ‘not let’ or by structures such as *disse não* ‘said no’).

Let’s look first at the rates of object control with the uninflected infinitive (OC_UNINFL_INF). Even though all groups produce this structure, they differ significantly—Kruskal-Wallis, $H(3) = 22.564$, $p < .001$ —and even 4-year-olds, the group with the higher rate of object control with uninflected infinitive, produce it significantly less than adults (Mann-Whitney, $U = 365.5$, $p < .05$). The adult group is split between object control with the uninflected infinitive and object control with the inflected infinitive (OC_INFL_INF). Both these structures are also produced by children, but at much lower rates, with the 5-year-olds approaching the adult level of object control with inflected infinitive. Examples of uninflected and inflected infinitives under control verbs are given in (51) and (52) respectively.

(51) ... ensinou os gatinhos a correr muito depressa. (3;10,00)
 taught the kittens PREP run.INF very quickly
 ‘... taught the kittens to run very quickly.’

(52) ... ensinou os gatos a nadarem. (5;7,10)
 taught the cats to swim.INF.3PL
 ‘... taught the cats to swim.’

Children differ from adults in other respects. First, they produce object control verbs with an implicit (omitted) argument (?OC_OMIT_ARG), either the propositional or the DP argument, as illustrated in (53a), and do so at rates significantly higher than adults—a Kruskal-Wallis test, $H(3) = 9.416$, $p < .05$, confirms a difference between the groups; a Mann-Whitney test shows that 5-year-olds, although producing fewer argument omissions than the other child groups, still significantly differ from adults ($U = 190.0$, $p < .05$). We take this as a first indication that children have difficulties projecting both internal arguments of an object control verb.

(53) a. ... ensinou a balançar. (3;08,23)
 taught to swing

b. ... ensinou os gatinhos. (3;11,04)
 taught the kittens

As in the previous conditions, they also avoid the use of the target matrix verb (Other). In several cases children avoided *proibir* ‘forbid’ by using a negative sentence with the causative verb *deixar* ‘let,’ which selects a single internal argument (54).

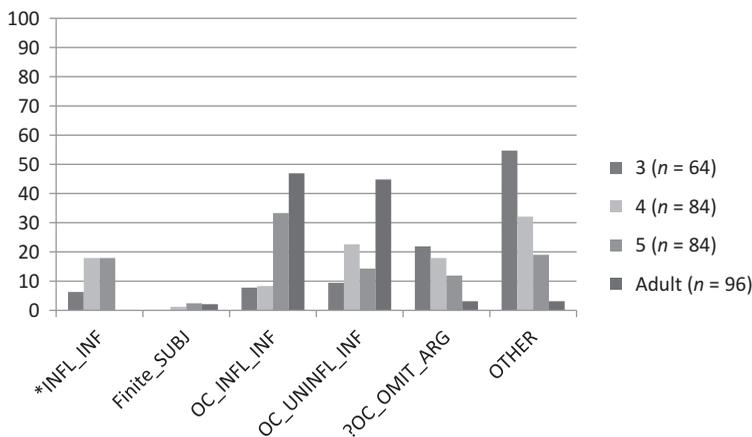


Figure 5. Results with matrix object control verbs (Condition 3).

- (54) O pai não deixou os elefantes irem para a água. (3;08,23)
 the father NEG let the elephants go.INF.3PL to the water
 ‘Dad didn’t let the elephants go into the water.’

One of the most important and interesting results in this condition is the occurrence of nontargetlike inflected infinitives (*INFL_INF) in lieu of OC. Children produce inflected infinitives with missing or misplaced prepositions, as illustrated in (55a–e).

- (55) a. ... ensinou [os gansos saltarem]. (4;05,12)
 taught the geese jump.INF.3PL
 (target: Ensinou os gansos a saltar(em))
- b. (O pai) proibiu eles irem para o lago. (5;06,12)
 the father forbade they go.INF.3PL to the lake
 (target: ... proibiu-os de irem para o lago.)
- c. (O macaco) ensinou a eles irem para cima da mesa. (5;01,18)
 the monkey taught PREP they go.INF.3PL to the top of.the table
 (target: ... ensinou-os a irem para cima da mesa.)
- d. (A mãe pata) proibiu de os patinhos irem ao pé
 the mother duck forbade PREP the little ducks go.INF.3PL PREP close
 do crocodilo. (5;01,00)
 of.the crocodile
 (target: ... proibiu os patinhos de irem ao pé do crocodilo.)
- e. O pai dos elefantes proibiu para irem ao mar. (5;09,04)
 the father of.the elephants forbade PREP go.INF.3PL to.the sea.
 (target: ... O pai dos elefantes proibiu-os de irem ao mar.)

The sentences in (55a,b) lack a preposition. Other sentences, for example (55c,d), contain the relevant preposition (*a* or *de*), but it appears in the position preceding the DP rather than preceding the infinitive as in the adult version. This fact, in association with the presence of the nominative subjects (55b,c), suggests that these complements are comprised of a single internal argument, e.g., [*os gansos saltarem*] in (55a), [*eles irem para cima da mesa*] in (55b) with the DPs [*os gansos*] or the nominative pronoun [*eles*] licensed as the subject of the inflected infinitive. Finally, in some cases children insert *para*, as illustrated in (55e). Santos et al. (2013) analyze *para* introducing an inflected infinitive as a true complementizer both in adult and child language.³²

All these facts strongly suggest that children are analyzing object control verbs as verbs that take a single propositional argument (i.e., they are assigning a V DP VP string to the structure V [DP VP]), as expected under SASH. And because they prefer complete functional complements, they take this propositional argument to be an inflected infinitive internally licensing its subject.

Although the illicit inflected infinitive response occurs with both object control verbs tested, it is much more frequent with *proibir* than with *ensinar*. Ungrammatical inflected infinitives with *proibir* reach 33% among 5-year-olds, whereas with *ensinar* they do not exceed 7% (observed in the 4-year-old group). Also, older children produce more ungrammatical structures with *proibir* than younger children because younger children largely avoid *proibir* (the percentage of production of “other” structures in items targeting *proibir* reaches 80% in the 3-year-old group).

To sum up the results of Condition 3, children do produce object control structures, but they do so significantly less than adults. Instead, children either avoid the target verb (54) or produce structures with an implicit argument (53) or ungrammatical inflected infinitives (55). The inflected infinitive complements allow the child to reanalyze the object DP as the subject of an infinitival clause. These facts support the CFC (34) and the SASH (35). We return to this issue in section 7, where we also discuss the higher frequency of ungrammatical inflected infinitives with *proibir*.

³²The same complementizer introduces the inflected infinitive complement of causatives (see footnote 29).

6.4. Subject control verb target

Condition 4 targeted subject control structures. As shown in Table 4, children in all groups produce target control structures with the verbs *querer* 'want,' *conseguir* 'be able to,' with even the 3-year-old group reaching 75% target production. Even though a Kruskal-Wallis test, $H(3) = 12.684$, $p < .05$, shows a general difference between the groups and a Mann-Whitney test shows that 5-year-olds still differ significantly from adults ($U = 330.0$, $p < .05$), the overall rates of the target subject control structure are higher than in the case of the object control condition.

Children were also tested on the same subject control verbs in contexts in which control was not possible because the referent of the embedded and matrix subjects were distinct (Condition 5 in Table 2). In this case, adults produce finite subjunctive complements, and this allows us to determine whether children distinguish the nonfinite control context from a context in which the matrix and the embedded subject have disjoint reference. In order to produce a noncontrolled complement, children were expected to produce a finite complement. The proportion of finite complements produced in this condition is presented in Table 5. Statistical analysis confirms a significant difference between the groups, ($H(3) = 14.339$, $p < .05$, and a significant difference between adults and the 5-year-olds, the child group with the most finite complement answers (Mann-Whitney, $U = 356.0$, $p < .05$).

In the target grammar, finite complements to these verbs are subjunctive. However, children produce some of these finite complements with an indicative verbal form (see 56), and they also showed several problems with the subjunctive morphology. Only 66% of the finite complements produced by the 3-year-old group are subjunctive, and even those cases are sometimes problematic in the realization of morphology; 91% of the finite complements produced by 5-year-olds are subjunctive.

The use of indicative in a context requiring subjunctive is illustrated in (56).

- (56) ... *queria que os gatos saíram.*
 want that the cats go.out.IND.Pres.3.PL
 (target: *queria que os gatos saíssem.*)

Children also produced (nontarget) nonfinite complements to these verbs in this context, but these are inflected infinitive complements (57). In this case, they either do not produce a complementizer (57a) or use the complementizer *para* 'for', which introduces a nonfinite complement, generally an inflected infinitive (57b) (see footnote 29), or the finite complementizer *que* 'that' (57c).

- (57) a. (O macaco) conseguiu saltarem, saltar os porquinhos. (5;01,23)
 the monkey was.able jump.INF.3PL jump.INF the little pigs
 b. (O panda) queria para os cangurus saltarem-se. (5;10,23)
 the panda wanted for the kangaroos jump.INF.3PL-clitic

Table 4. Subject Control (Condition 4).

Group	Subject control
3	75%
4	88.1%
5	86.9%
Adult	97.9%

Table 5. Condition 5: Subject Control Verbs in "Disjoint" Contexts.

Group	Finite complements
3	32.8%
4	33.3%
5	39.3%
Adult	60.4%

- c. (O polícia queria) que os gatos entrarem no seu carro. (5;07,10)
 the policeman wanted that the cats go.into.INF.3PL in.the his car

Interestingly, what we do not find in this condition are cases of nonfinite complements of *querer* ‘want’ with an uninflected infinitive and a nonobligatorily controlled null subject.³³ This contrasts with Landau & Thornton (2011), who find such constructions in very early stages of English (e.g., [58]). Landau & Thornton propose that children first assume that the complement to English *want* is subjunctive, which would explain why they accept complements of *want* with a noncontrolled null subject, as in (58), and with a lexical DP, as (59), in which infinitival *to* and third person singular agreement are absent, as in English subjunctives, e.g., *I demand (that) you do it*, *I demand (that) Daddy sing*.

(58) Context: Laura wanted mother to push her in the stroller.

Laura: I want __ push Laura. (1;07,19)

‘I want Mommy/you to push Laura’ Landau & Thornton (2011:921)

(59) a. I want you do it. (2;1.09)

b. I want Daddy sing. (2;1.10) Landau & Thornton (2011:928)

The avoidance strategies we see in our data suggest that the subjunctive is a difficult structure for children. Apart from the general crosslinguistic difficulty that we find in the acquisition of subjunctives (e.g., Grinstead 2000; Iverson, Kempchinsky & Rothman 2008), it is unclear why English-speaking children in particular would adopt a subjunctive analysis. Subjunctives are marginal in adult English, hence unlikely to appear in the child’s input, and the lack of infinitival and tense/agreement morphology (missing *to/-s*) is not a universal feature of subjunctives. Indeed, the Romance languages all have subjunctive verbal paradigms.

Although it is not exactly clear what the Landau & Thornton (2011) analysis would predict for a language that has a more robust (and morphologically visible) subjunctive, such as European Portuguese, our results show that the children strongly avoided subjunctive complements where they were possible, (i) with *want*-type verbs, and (ii) also under causative verbs, as shown in section 6.1 (Figure 3). We think this further renders the “subjunctive” analysis of English *want* implausible. What seems plausible instead is that children are aware of the complex relations between finiteness and control, as discussed in Landau (2004), including both the availability of control into finite clauses (e.g., controlled subjunctives in Balkan languages, see Landau [2004:825, footnote 11] for a summary of references), as well as the possibility of noncontrolled subjects of infinitives (e.g., inflected infinitives in European Portuguese). In the English cases in (58) and (59), discussed by Landau & Thornton, children may be attempting to license the subject internally to the infinitive, in accordance with the CFC.

Summing up the results of Conditions 5 and 6, we see that children have no problem with control per se and produce target subject control restricted to subject control contexts. We also do not see cases of uncontrolled (disjoint) null subjects (the type of cases found by Landau & Thornton 2011). These results contrast with those we observed for object control in our experiment (Condition 3).

6.5. Comparing spontaneous and elicited production

Earlier in section 4 we saw that in spontaneous production children effectively avoided using “hard” structures such as RtO and OC, as predicted by Snyder’s (2011) Conservatism Hypothesis. In elicited

³³The only exceptions are a very few cases such as (i) in a context in which the panda asked someone else to jump. This occurred only in this particular item, and it is possible that the context made children think that the panda also wanted to jump with the other animals. This interpretation is indeed suggested by answers that include “also” or “with the kangaroos,” making reference to the other characters who were supposed to jump.

(i) O panda queria saltar (também / com os cangurus).
 the panda wanted jump.INF (also / with the kangaroos)
 ‘The panda wanted to jump (too / with the kangaroos).

production, where children are provided with a specific syntactic frame and verb, we find that they are able to produce these structures but do so to a significantly lesser degree than adults, preferring instead to produce inflected infinitives, the PIC, or finite clauses. Also, we find many errors of commission—largely absent in the spontaneous production of sentential complementation (e.g., finite clauses with indicative under *querer* ‘want’ or *conseguir* ‘be able to,’ inflected infinitives under the same verbs, a single inflected infinitive complement of object control verbs, or the PIC with nominative subjects).

Elicited production is often used to reveal children’s knowledge of aspects of grammar that may not readily show up in spontaneous production because of sampling problems, for example, constructions that are infrequent in normal language use, for example the passive *by*-phrase, which requires a particular pragmatic context (see, e.g., Pinker, LeBeaux & Frost 1987; Crain, Thornton & Murasugi 2009; and Snyder & Hyams 2015). In our study, the use of elicited production, especially when compared to spontaneous production, has instead revealed something important about the principles that children operate under when they must accommodate to a grammatical context that is, to a greater or lesser degree, beyond their competence (or is in any case outside their grammatical “comfort zone”). In this case children show a marked preference for complements that are functionally complete in the sense of the CFC (33/34) and which correspond to a single internal argument, as proposed by the SASH (35).

7. Summary and concluding remarks

In this article we explored the general question of what constitutes complexity for the child in the domain of complementation and how children deal with the (at least) two problems associated with learning complementation—the string identity problem and the multiple frames problems. We used European Portuguese, a language rich in complementation types to investigate these questions. A priori it might be that children find all complement types equally available. Based loosely on findings from other studies (comprehension and spontaneous production), we offered two hypotheses concerning the argument structure the child would assume when faced with a novel verb where there is potential ambiguity. These principles—CFC and SASH—constitute hypotheses about what the child finds simplest. In contrast to most previous studies, which tested comprehension, we gave the children a sentence completion task in which they were free (within limits) to continue the sentence with any of a number of complement types. We hoped that this would give us a measure of what structures the child finds most accessible.

Overall, our results showed that children favored those complement types that correspond to a complete functional domain. Under perception verbs, for example, they overwhelmingly produced PIC complements and finite indicatives. Finite complements are CFCs, and it is possible that the child takes a PIC structure under a perception verb as a CFC. This might be reinforced by the fact that PIC structures surface in root contexts (see discussion in section 6.2).

Under causatives they produced inflected infinitives and infinitives without causee. Structures that did not constitute CFCs were largely avoided, notably RtO. The preference for inflected infinitives over RtO is directly explained by our CFC hypothesis: inflected infinitives are complete functional complements; RtO complements are not. The infinitives under causatives without causee (see [43a], repeated as [60]) deserve further discussion. We have seen that this type of structure is possible in the adult grammar with an arbitrary reading: it is thus possible that it corresponds to a structure such as (61), where a PRO_{arb} occupies the subject position of the embedded complement. In this case, the embedded complement would correspond to a CFC.

(60) ... mandou dormir. (3;09,09)
 ordered sleep

(61) mandou [CP/TP PRO_{arb} dormir]

Additionally, while our results are in line with Landau and Thornton's (2011) proposal that children avoid "defective structures" in favor of CP complements (an instance of a CFC), we cannot say that subjunctive complements constitute a default structure for children. Instead, we suggest that children acquiring English may try the possibility (made available by UG) of licensing a subject internally to an infinitival clause.

Children also eschewed NP_CP complements under object control verbs, in accordance with our second hypothesis that they would prefer a single (clausal) argument (SASH). In structures targeting object control, children evaded the multiple arguments in a variety of ways—omitting either the propositional or DP argument, changing the matrix verb to a noncontrol verb, and most interestingly, producing an inflected infinitive clause (ungrammatical in the adult language in this context).

While SASH and CFC both define children's early preferences with respect to complement structure, they operate at different levels of grammar. SASH refers to the child's initial (default) analysis of verb argument structure. The CFC, in contrast, pertains to the child's preferred syntactic structure. Importantly, SASH does not claim that children are unable to project a structure with two internal arguments, rather, it says that where possible children will analyze the input as corresponding to a verb taking a single propositional argument. Thus, this hypothesis is consistent with the observation that some children deviate from the target grammar more often with some verbs (presumably later acquired) than with others: for example, more nontarget inflected infinitive complements to *proibir* 'forbid' than to *ensinar* 'teach.' The nontarget complements occur until the child gets evidence that forces a reanalysis of the argument structure of the verb (for example, a sentence in which only one of the internal arguments is clefted may be relevant positive evidence for a ditransitive analysis of the verb).³⁴

Overall, we found little support for either the "raising (to object) first" (Kirby 2011) or the "control first" (Landau & Thornton 2011) hypotheses. We instead reinterpreted the insights behind those hypotheses as proposals on what might be complex for children when acquiring complement structures. The experiment presented here was not designed to pit control and raising against each other, and indeed our findings cannot be taken to mean that children cannot perform raising or (object) control. Rather, our results tell us about children's initial biases. Interestingly, they suggest that the inflected infinitive, a marked structure from a typologically point a view, may be a "winning structure," since it conforms to a CFC and to the default hypothesis about argument structure (SASH): inflected infinitives probably emerge in all these structures because SASH at the lexicon and CFC at syntax conspire to make it the best option in a child grammar.

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³⁴Similarly, SASH is able to explain why children are biased to analyze certain verbs as selecting a single propositional argument, while at the same time easily producing other ditransitive control verbs. Indeed, children substituted the causative *mandar* 'make' by the ditransitive control verb *dizer para* 'tell' in target-like structures. SASH is a hypothesis about children's initial bias in mapping the input onto a verb's argument structure; this initial bias is overcome through contact with relevant input pertaining to each particular verb.

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Appendix

Condition 1—Causative Verb

1. Situation: Two piglets ask their mother for permission to eat a carrot, and she allows them to do so.

Experimenter: Os porquinhos pediram uma coisa e a mãe deixou.
The piglets asked to do something and the mother let them do it.

Puppet: **A mãe deixou o quê? A mãe ...**
the mother let what? the mother ...
'The mother let them do what? The mother ...'

2. Situation: The little tigers ask their father to let them push the cart, and he allows them to do so.

Experimenter: Os tigrinhos pediram uma coisa e o pai deixou.
The little tigers asked to do something and their father let them do it.

Puppet: **O pai deixou o quê? O pai ...**
the father let what? the father ...
'The father let them do what? The father ...'

3. Situation: The cop's car is not moving. He asks the elephants for help. The father elephant tells his two sons to push the cop's car.

Experimenter: O pai é que manda nos elefantezinhos.
Dad is the one who tells the little elephants what to do.

Puppet: **O pai mandou o quê? O pai ...**
the father made what? the father ...
'The father made them do what? The father ...'

4. Situation: The mother sheep tells her two children to eat their lettuce. The two little sheep obey her.

Experimenter: A mãe é que manda nas ovelhinhas.
The mother is the one who tells the little sheep what to do.

Puppet: **A mãe mandou o quê? A mãe ...**
the mother made what? the mother ...
'The mother made them do what? The mother ...'

5. Situation: The two little sheep ask their mother to let them dance, and she allows them to dance.

Experimenter: As ovelhinhas pediram uma coisa e a mãe deixou.
The little sheep asked to do something and the mother let them do it.

Puppet: **A mãe deixou o quê? A mãe ...**
the mother let what? the mother ...
'The mother let them do what? The mother ...'

6. Situation: the two little elephants ask their father to let them go outside and play, and he allows them to do so.

Experimenter: Os elefantezinhos pediram uma coisa e o pai deixou.
The little elephants asked to do something and their father let them do it.

Puppet: **O pai deixou o quê? O pai ...**
the father let what? the father ...
'The father let them do what? The father ...'

7. Situation: The father tiger tells his two children to get out of the house, and they obey.

Experimenter: O pai é que manda nos tigrinhos.
The father is the one who tells the little tigers what to do.

Puppet: **O pai mandou o quê? O pai ...**
the father made what? the father ...
'The father made them do what? The father ...'

8. Situation: The mother pig tells her two children to go to sleep, and they obey her.

Experimenter: A mãe é que manda nos porquinhos.
The mother is the one who tells the piglets what to do.

Puppet: **A mãe mandou o quê? A mãe ...**
the mother made what? the mother ...
'The mother made them do what? The mother ...'

Condition 2—perception verbs

9. Situation: Two tigers eat a steak. A lion is watching them.

Experimenter: O leão viu o que aconteceu. Os tigres ...
The lion saw what happened. The tigers ...

Puppet: **O que é que o leão viu? O leão ...**
what is that the lion saw? the lion ...
'What did the lion see? The lion ...'

10. Situation: Two pigs push a shopping cart. A dog is watching the scene.

Experimenter: O cão viu o que aconteceu. Os porcos ...
The dog saw what happened. The pigs ...

Puppet: **O que é que o cão viu? O cão ...**
what is that the dog saw? the dog ...
'What did the dog see? The dog ...'

11. Situation: Two horses dance. A zebra is watching the scene.

Experimenter: A zebra viu o que aconteceu. Os cavalos ...
The zebra saw what happened. The horses ...

Puppet: **O que é que a zebra viu? A zebra ...**
what is that the zebra saw? the zebra ...
'What did the zebra see? The zebra ...'

12. Situation: Two little tigers are running and fall down. Their father is watching the scene.

Experimenter: O pai tigre viu o que aconteceu. Os tigres pequeninos ...
The father tiger saw what happened. The little tigers ...

Puppet: **O que é que o pai tigre viu? O pai tigre ...**
what is that the father tiger saw? the father tiger ...
'What did the father tiger see? The father tiger ...'

Condition 3—object control verb

13. Situation: The monkey is jumping on the table. Two ducks are watching, and they say they want to jump onto the table too. The monkey teaches them how to do it.

Experimenter: O macaco ensinou.
the monkey taught it.

Puppet: **O que é que o macaco fez? O macaco ...**
what is that the monkey did? the monkey ...
'What did the monkey do? The monkey ...'

14. Situation: The two little elephants want to dive into the lake. The father forbids them to do it.

Experimenter: O pai proibiu.
The father forbade it.

Puppet: **O que é que o pai fez? O pai ...**
what is that the father did? the father ...
'What did the father do? The father ...'

15. Situation: The two cats want the bear to teach them how to swim. He teaches them to do it.

Experimenter: O urso ensinou.
The bear taught it.

Puppet: **O que é que o urso fez? O urso ...**
what is that the bear did? the bear ...
'What did the bear do? The bear ...'

16. Situation: The ducklings ask their mother to let them take a peek at the crocodile. She forbids them to do it.

Experimenter: A mãe pata proibiu.
The mother duck forbade it.

Puppet: **O que é que a mãe pata fez? A mãe pata ...**
what is that the mother duck did? the mother duck ...
'What did the mother duck do? The mother duck ...'

Condition 4—subject control verbs (in subject control contexts)

17. Situation: The two children ask their mother to let them push the cart, and she allows them to do so.

Puppet: **O que é que os meninos queriam? Os meninos ...**
what is that the children wanted? the children ...
'What did the children want? The children ...'

18. Situation: The two children ask their mother to let them ride a skateboard, and she allows them to do so.

Puppet: **O que é que os meninos queriam? Os meninos ...**
what is that the children wanted? the children ...
'What did the children want? The children ...'

19. Situation: The cats show the crocodile that they can jump over him.

Puppet: **O que é que os gatos conseguiram? Os gatos ...**
what is that the cats managed to? the cats ...
'What did the cats manage to do? The cats ...'

20. Situation: The mother doubted that the rabbits could ride the skateboard, but then they manage to do it.

Puppet: **O que é os coelhos conseguiram? Os coelhos ...**
 what is that the rabbits manage to? The rabbits ...
 'What did the rabbits manage to do? The rabbits ...'

Condition 5—subject control verbs (with disjoint reference of the main and the embedded subject in finite complements)

21. Situation: The panda wants to see the kangaroos jump, and they oblige him.

Puppet: **O que é que o panda queria? O panda ...**
 what is that the panda wanted? the panda ...
 'What did the panda want? The panda ...'

22. Situation: The monkey is on a table. Two pigs want to join him, and although they are very heavy the monkey manages to help them get on the table.

Puppet: **O que é que o macaco conseguiu? O macaco ...**
 what is that the monkey managed to? the monkey ...
 'What did the monkey manage to do? The monkey ...'

23. Situation: The cop makes the cats get in his car.

Puppet: **O que é que o polícia queria? O polícia ...**
 what is that the cop wanted? the cop ...
 'What did the cop want? The cop ...'

24. Situation: The mother tells her two piglets to jump over the lake, and they obey (she does not jump).

Puppet: **O que é que a mãe porca conseguiu? A mãe porca ...**
 what is that the mother pig managed to? he mother pig ...
 'What did the mother pig manage to do? The mother pig ...'