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Research Article

Dativizable or Non-dativizable: That is the question? A syntactic-semantic analysis of English (non)-dativizable constructions in the production of a set of 2L1 English/Spanish simultaneous bilingual twins

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Abstract. This paper analyzes the syntactico-semantic factors which trigger Dative shift in English dativizable verbs, i.e. those verbs that allow alternation between double object and prepositional complement constructions. It also focuses on non-dativizable verbs that restrict their subcategorization framework to either double object or prepositional complement constructions. This syntactico-semantic relation between dativizable and non-dativizable structures is addressed in acquisition by examining the incidence for the two verb types in a set of English/Spanish 2L1 bilingual twins. Our results show that the syntactic and semantic features that dativizable and non-dativizables present go hand in hand with the age of first occurrence and the language development of the participants. Hence, dativizable to-dative double object constructions (DOC) are the utterances produced the earliest at the age of 2, as opposed to dativizable *to/for*-datives and non-dativizable constructions, which begin to emerge at around the age of 3. Finally, our results also suggest that the high adult input frequency explains the twins' early production of dativizable structures and that, in the same way, the children's low exposure to non-dativizable utterances correlates with the later occurrence in the twins' spontaneous production.

Keywords: dativizable, non-dativizable, DOC, to/for-dative, bilingual acquisition, L1 English

1 Introduction

Over the last few decades, the so-called (non)-dativizable constructions have been broadly studied from different syntactico-semantic perspectives. As illustrated in (1), the verbal subcategorization of these structures can project their arguments as double object complements (i.e. indirect object (Oi)-noun phrase (NP) along with a direct object (Od)-NP), or as an object complement followed by a prepositional object preceded by the preposition *to* or *for*, as shown in (2). Despite the fact that dativizable verbs have both verb complementation possibilities, there are some others, as shown in (3), that lack this syntactic alternation (non-dativizable verbs, henceforth).

(1)	a. He bought me a beer	(dativizable *for*-dative double object)
	b. They offered her some food	(dativizable *to*-dative double object)
(2)	a. He bought a beer for me	(dativizable *for*-dative)
	b. They offered some food to her	(dativizable *to*-dative)
(3)	a. He told me that story	(non-dativizable double object)
	b. The teacher explained it to his students	(non-dativizable *to*-dative)
	c. I thanked her for her help	(non-dativizable *for*-dative)

The possibility of a single verb to project their verbal argument complements both as double objects (DOCs) (examples in (2)) and as object plus prepositional constructions (examples in (1)) has triggered the debate in the literature of dativizable constructions as to which structure is syntactically base-generated and which one is derived (see section 2). Contrarily, the so-called non-dativizable verbs (examples in (3)) restrict their sub-

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categorization framework, as either DOCs or prepositional structures, they lack a dativizable counterpart.

In view of the potential argument alternation or dative shift of some verbs, semanticists have also posed some issues concerning the meaning that dativizable and non-dativizable constructions convey. Some linguists claim that there is no difference in the meaning when verbs allow argument alternative choices (Aoun & Audrey Li, 1989; Hale & Keyser, 2002; Krifka, 2003; Levin, 1993; Oehrle, 1976; Pinker, Lebeaux & Frost, 1987; Pylkkänen, 2002) unlike others who argue that there are semantic distinctions between dativizable DOCs and dativizable prepositional constructions (Green, 1974; Krifka, 2003; Greenbaum, Leech, Svartvik & Quirk, 1985).

Taking these syntactico-semantic issues into account, the aim of this study is to disentangle the syntactic and semantic dichotomies that exist in the literature of English dativizable and non-dativizable constructions by looking at their production in spontaneous speech. The participants of this research are a set of English/Spanish simultaneous bilingual twins, Simon and Leo. As mentioned above, only one of the L1s of these children is examined, namely, English.

This paper is organized as follows: section 2 reviews previous works both from the side of linguistic theory discussing the factors governing the syntax and semantics of these constructions, as well as those from the point of view of the acquisition of dativizable and non-dativizable constructions. Section 3 includes the hypotheses that guide this study. Data selection and classification criteria are presented in section 4. The data analysis is developed in section 5 on the basis of the following variables: (a) age, (b) MLUw, and (c) input. Section 6 presents the conclusions and points to directions for further work.

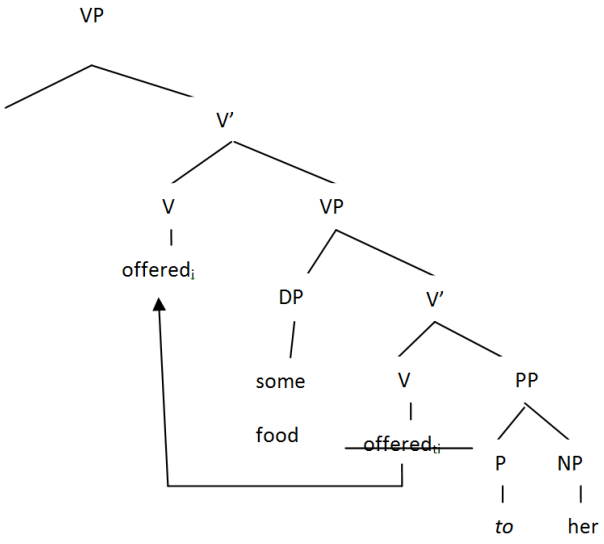
2 Theoretical background and previous acquisition studies

2.1 Syntactic approach to (non)-dativizable constructions

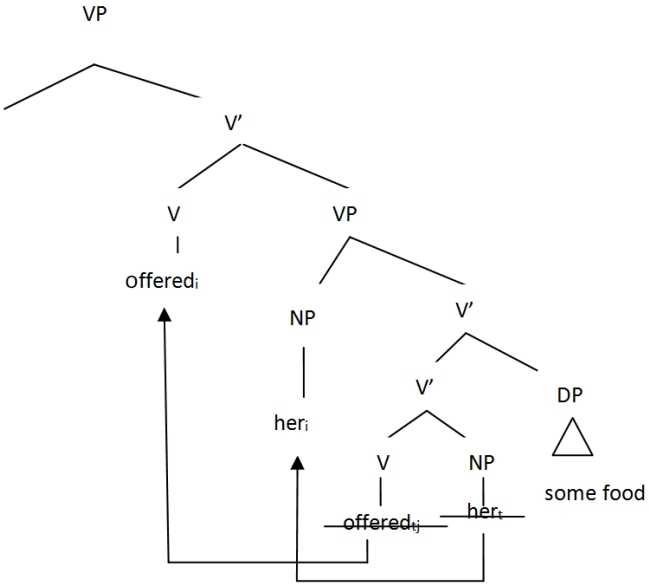
The so-called dativizable constructions have led to a dichotomy as far as their syntactic derivation is concerned. Some linguists (Aoun & Audrey Li, 1989; Snyder & Stromswold, 1997) claim that dativizable double object constructions are the basic structure from which dativizable *to/for*-datives derive. Alternatively, there are those who argue that dativizable DOCs are syntactically generated from *to/for*-dative structures (M. C. Baker, 1997; Chomsky, 1955; Larson, 1988, 1990).

Regardless of the semantic principle of Uniformity of Theta Assignment Hypothesis (M. C. Baker, 1988, UTAH,) which states that *"identical thematic relations between items are represented by identical structural relations between these items at D(eep)-structure"*, the underlying symmetry of thematic roles between dativizable DOCs and dativizable *to/for*-datives is not displayed in their S(urface)-structure. According to Larson (1988), *to/for*-dative constructions are the basic dativizable constructions from which dativizable *to/for*-dative DOCs derive. The verbal head in dativizable *to/for*-datives subcategorizes for a prepositional phrase (PP), headed by the preposition *to* or *for*. As illustrated in (4), the verbal head *offered* triggers head-to-head movement and rises to the specifier of the higher V' in order to meet Case and theta requirements, leading to what Larson terms the non-shifted version. In turn, Larson claims that dativizable DOCs derive from dativizable *to/for*-datives in a passive-like process, shaping, what he terms, the shifted version. More specifically, and as shown in (5), the preposition *to*, which is a case assigner in the non-shifted version in (4), absorbs its case being assigned to its prepositional complement *her*. This absorption of Case triggers NP-movement of *her* to the specifier of the lower VP. Similarly, the verbal head rises into the specifier of the higher V' in order to assign Case and theta role to its adjacent argument *her*. Due to this verbal movement, the Od in the non-shifted version is caseless; hence, it reduces its argument position to a non-thematic adjunct position, analogous to passive *by*-phrases, as depicted in (5).

(4) They offered some food to her (dativizable *to*-dative)



(5) They offered her some food (dativizable DOC)



Alternatively, it has been argued that dativizable *to/for*-datives are derived from dativizable DOCs by a passive-like process, where, as opposed to the previous argument, the Oi occupies an adjunct position via NP-movement (Aoun & Audrey Li, 1989; Snyder & Stromswold, 1997). Hence, example (4) derives from (5). In fact, as will be discussed in section 2.3, Snyder and Stromswold (1997) argue that the lexical item *to* is the factor delaying the acquisition of dativizable *to*-dative constructions.

Unlike dativizable verbs whose arguments can be projected as double object complements or as objects followed by prepositional complement constructions headed by the lexical item *to/for*, non-dativizable DOCs and non-dativizable prepositional verbs do not have the syntactic strength to trigger dative shift. As illustrated in (6a), the non-dativizable verb *explain* can only subcategorize *to*-dative complements, hence the ungrammaticality of (6b).

(6)	a. The teacher explained it to his students	(non-dativizable *to*-dative)
	b. *The teacher explained his students it	(ungrammatical non-dativizable *to*-dative)

Larson (1990) accounts for the argument restrictions of non-dativizable *to*-dative verbs as the impossibility of the oblique preposition to undergo case marking. Consequently, unlike his argument concerning the derivation of dativizable DOCs (Larson, 1988), the absorption of the preposition *to* in prepositional non-dativizables via a passive-like process would violate the recoverability of deletion or Dative shift.

Furthermore, the syntactic alternation of non-dativizable constructions is mainly restricted in the lexicon. Thus, verbs of Latin origin, as exemplified in (8) with the verb *donate*, can only take an [NP *to*-NP] complement. Furthermore, this factor that prevents the alternation of non-dativizable structures is also linked to verbal semantics. In particular, only morphologically native verbs, as illustrated in (7), are capable of triggering dative shift (Mazurkewich & White, 1984; Green, 1974; Oehrle, 1976).

(7)	a. He gave me \$50	(DOC dativizable native verb)
	b. He gave \$50 to me	(*to*-dative dativizable native verb)
(8)	a. He donated \$50 to me	(non-dativizable *to*-dative Latinate verb)
	b. *He donated me \$50	(ungrammatical non-dativizable DOC, Latinate verb)

2.2 Semantic approach to ditransitive constructions

Regarding semantic factors in (non)-dativizable ditransitive constructions, different studies have pointed out that there are divergences in meaning between both structures (Aoun & Audrey Li, 1989; Hale & Keyser, 2002; Krifka, 2003; Levin, 1993; Oehrle, 1976; Pinker et al., 1987; Pylkkänen, 2002). These denotative differences, as will be shown below, do not go hand in hand with the syntactic derivation of both structures argued in section 2.1. Nevertheless, there are arguments that point to a common underlying semantic ground between dativizable and non-dativizable constructions (Green, 1974; Krifka, 2003; Greenbaum et al., 1985).

On the one hand, some linguists assume that there is a transfer of possession relation (i.e., a cause-HAVE relation) hidden between the Oi and the Od in dativizable DOCs (Aoun and Audrey Li, 1989; Hale and Keyser, 2002; Krifka, 2003; Levin, 1993; Oehrle, 1976; Pinker et al., 1987; Pylkkänen, 2002). As depicted in (9), the Oi *her* is narrowly related in a possession relation with the Od *some food*. In other words, the causal agent *they* causes the possessor *her* to have *some food* (theme).

(9)	a.	They	offered	her	some	food	(dativizable DOC)
	b.	*Casual agent*		*possessor/goal*		*possessum/theme*	*thematic roles*
	c.	*'X*	*causes*	*Y*	*(to HAVE)*	*Z'*	*semantic structure*

It should be noted that the possession transfer relationship in dativizable DOCs does not infer that the Oi ends up *possessing* the Od (Aoun & Audrey Li, 1989; Hale & Keyser, 2002; Krifka, 2003; Levin, 1993; Oehrle, 1976; Pinker et al., 1987; Pylkkänen, 2002). As illustrated in (10), the causal agent *I* sends a letter to *Bill* but we cannot guarantee that *Bill* will receive it. Thus, even though dativizable DOCs imply a possession relation, the fact that the possessor ends up possessing the theme is not always accomplished.

(10) I sent Bill that letter (but he never got it)

On the other hand, dativizable *to/for*-dative constructions are claimed to denote literal or metaphorical motion towards a goal (for example, they express a mental movement as in the verbs *show* or *tell*). In other words, they suggest a cause-GO/cause-GOAL relation between the cause/patient and the path/goal thematic roles. As exemplified in (11), the causal agent *they* caused the cause/patient *some food* to go to the path/goal *her*.

(11)	a.	They	offered	some food	to her	(dativizable DOC)
	b.	*Casual agent*		*cause/patient*	*path/goal*	*thematic roles*
	c.	*'X*	*causes*	*Y*	*(to GO to) Z'*	*semantic structure*

There are also arguments that point to a common underlying semantic ground between dativizable structures (Bruening, n.d.; Green, 1974; Krifka, 2003; Rappaport Hovav & Levin, 2008; Greenbaum et al., 1985). Hence, dativizable DOCs and dativizable *to/for*-dative constructions are equally regarded as verbs of transfer of possession (cause-HAVE relation) and verbs of motion (cause-GO/cause-GOAL). As depicted in (12), where *John* gives *Mary a book*, a twofold explanation can be given: (a) the book is moved from John's possession into Mary's possession (transfer of possession meaning, taking into account dativizable DOCs as the basic semantics) or, (b) possession of the book was transferred from John to Mary (cause-Go/cause-Goal relation, taking into account dativizable *to/for*-datives as the semantic referential point).

(12) a. John gave Mary a book
b. John gave a book to Mary

Non-dativizable semantic restrictions are correlated with their corresponding dativizable counterparts (Comrie, Malchukov & Martin H., 2010; Oehrle, 1976). More specifically, non-dativizable DOCs are rooted in the absence of motion along some path in the same way as non-dativizable *to/for*-dative constructions lack a transfer of possession meaning. As can be seen in (13), the causal agent *John* causes the patient theta role *Max* to metaphorically possess *a kick* (path/goal).

(13)	a.	John	gave	Max	a kick	(non-dativizable DOC)
	b.	*Causal agent*		*cause/patient*	*path/goal*	*thematic roles*
	c.	*'X*	*causes*	*Y*	*(to GO to) Z*	*semantic structure*

Thus, the compositional semantics of the verbal phrase (VP) in non-dativizable DOCs is not compatible with the direction/path feature encoded in dativizable *to/for*-dative constructions. In other words, the example in (14) cannot be understood, according to Malchukov and Oehrle's principles, as John's causing a kick to go to Max; thus its ungrammaticality.

(14) *John gave a kick to Max (ungrammatical non-dativizable DOC)

2.3 Previous studies on the acquisition of (non)-dativizable constructions

A small number of studies have been carried out in order to examine the order of acquisition of dativizable structures. Gropen, Pinker, Hollander, Goldberg and Wilson (1989) analyzed the spontaneous speech of 5 L1 English children in the Brown corpus in CHILDES (MacWhinney, 2000, Child Language Data Exchange System,). They found out that children start producing dativizable DOCs and dativizable prepositional constructions simultaneously in the second year, with neither structure subsequently uttered after the other. However, Snyder and Stromswold (1997) replicated Gropen et al.'s study including more participants and proposed that dativizable DOCs and dativizable *to*-datives depend on two parametric properties: property A allows the grammar to produce dativizable DOCs as opposed to dativizable *to*-datives which merge the property of dativizable DOCs with another property, termed by Snyder and Stromswold as property B. Taking these observations into account, they implemented a study of the data from L1 English children to analyze the correlation in the acquisition of both structure types. Their results showed that dativizable DOCs are crucially acquired before dativizable *to*-datives as indicated by a sign test ($p = .00098$) and a t test ($t(11) = 4.15, p = .002$). However, this order effect in acquisition did not correlate with the children's input.

The acquisition of the dative alternation has also been correlated with the presence or the lack of negative evidence of these structures in the child's input (C. L. Baker, 1979; Gropen et al., 1989). In particular, C. L. Baker (1979) claims that children are conservative in their productions since their output will be affected by the input they have received. Hence, non-dativizable constructions like those in (15a) will be generalized as dativizable structures (see example (15b)) because the child has heard non-dativizable utterances less frequently in his/her input. In other words, children are not aware of non-dativizable verbal constraints in their emerging language development since children apply them to verbs that do not allow dative shift in the adult grammar (Mazurkewich & White, 1984).

(15) a. I donated a book to the library (non-dativizable to-dative)
b. *I donated the library a book (ungrammatical non-dativizable DOC)

Viau (2007) carried out a study dealing with the semantics of dativizable structures in L1 English acquisition. He attempted to demonstrate that dativizable DOCs denote transfer of possession by analyzing the correlation in acquisition between dativizable DOCs and *have* (the verb of possession par excellence), between prepositional constructions and the verb *go* (the verb of motion par excellence) and between dativizable DOCs and dativizable prepositional constructions and causative verbs. His results showed that dativizable DOCs convey transfer of possession since they are concurrently acquired with the verb *have*, in the same way as dativizable prepositional constructions denote motion shown in the correlation in acquisition with the verb *go*. In turn, dativizable DOCs and dativizable prepositional constructions display a correlation in acquisition with *causative* verbs. Despite the latter results, dativizable prepositional structures were acquired later than dativizable DOCs.

It should be noted that there is not much research on the acquisition of non-dativizable constructions. Thus, further investigations should be carried out in order to fill the gap of studies that deal with this type of constructions.

3 Hypotheses

Taking into account these previous studies on the linguistic description of the structures under analysis, as well as those on their acquisition, the following possible scenarios might be postulated in the acquisition data of (non)-dativizable constructions:

- Hypothesis 1: If dativizable *to/for*-datives are transformationally derived from dativizable DOCs via a passive-like process, then dativizable *to/for*-datives are expected to be acquired later than dativizable DOCs.
- Hypothesis 2: If, on the contrary, dativizable DOCs are transformationally derived from dativizable *to/for*-datives via a passive-like process, then dativizable *to/for*-dative are expected to be produced earlier than dativizable DOCs.
- Hypothesis 3: Regardless of the derivational accounts between dativizable *to/for*-datives and dativizable DOCs, dativizable *to*-dative and *for*-dative constructions are expected to be concurrently acquired since, despite the syntactic status of the *to*-PP and *for*-PP as subcategorized constituents or as adjuncts, respectively, they are considered to be a syntactic block of prepositional ob-

ject dativizable constructions as they are able to trigger dative shift resulting in DOCs.

- Hypothesis 4: If dativizable *to/for*-dative constructions require a lexical item *to/for* in order to meet semantic motion requirements (cause-GO), then it is expected that children acquire them at a later stage, as opposed to dativizable DOCs, which, in contrast, do not require an additional constituent to accomplish the semantic attribution of transfer of possession (cause-HAVE).
- Hypothesis 5: If semantics plays a role, despite restrictions in the subcategorization framework of non-dativizable constructions, a correlation in acquisition is expected between those constructions that share a semantic analogy, i.e., between dativizable and non-dativizable DOCs, as they have a cause-HAVE relation, and between dativizable and non-dativizable *to/for*-datives, as they imply a cause-GO relation.
- Hypothesis 6: If non-dativizable constructions are subject to syntactic and semantic constraints, then a later acquisition is expected for non-dativizable constructions as opposed to dativizable structures, which do not offer any limitations in their subcategorization framework or in their semantics.
- Hypothesis 7: If input is taken into account, the order of acquisition will correlate with the frequency with which a child is exposed to (non)-dativizable constructions.

Thus, the acquisition data, which revolve around the above-mentioned hypotheses, aim at shedding some light on the actual analysis of (non)-dativizable structures. That is, the results of this study will reflect how acquisition data can explain the syntactic and semantic properties of those constructions.

4 Methodology

4.1 Data selection

In order to provide an answer regarding the relative order of production of English dativizable and non-dativizable DOCs and dativizable and non-dativizable *to/for*-dative constructions, we have extracted child data from the FerFulice corpus available in the CHILDES project (MacWhinney, 2000, Child Language Data Exchange System,). More specifically, we have conducted our study by analyzing the production of a set of Spanish/English simultaneous bilingual twins, who were born and raised in a Spanish geographical background. Parents address children using the one-parent one-language strategy (Melanie, the mother, engages in conversations with the children in English as she is an English native speaker, whereas the father, Ivo, addresses them in Spanish as he is a Spanish native speaker) (Fernández Fuertes & Liceras, 2010, more information on the children's background as well as on the data collection process appears in). It should be noted that the analysis of this study has focused on the spontaneous production of English (non)-dativizable utterances so that only one of the L1s of these children is analyzed, i.e. English. The age range that covers this longitudinal corpus ranges from 1.0 to 6.5 years old and for this study the corpus has been analyzed in its entirety.

The search for both dativizable and non-dativizable ditransitive instances has been manually done by taking into account the following patterns of subcategorization: (a) S+V+NP+NP (for (non)-dativizable DOCs) and (b) S+V+NP+*to/for*-NP (for (non)-dativizable *to/for*-dative constructions). We have implemented the same process for the twins and for the child-directed speech (to analyze the adult input).

4.2 Data classification

Data have been classified regarding the type of participant, the children's age and the Mean Length of Utterance measured in words (Brown, 1973, MLUw;). Besides, concerning the type of construction, we have considered those structures which trigger Dative shift (i.e. dativizable structures), classifying them as those verbs which subcategorize for an Od along with a *for*-dative PP and, which are dativizable as DOCs, as shown in (16). Similarly, we have also taken into account dativizable constructions which allow for a *to*-dative PP in their subcategorization framework, and which, in turn, trigger Dative shift of their arguments as dativizable DOCs, as depicted in (17).

(16)	a. He bought a house for me	(dativizable *for*-dative)
	b. He bought me a house	(dativizable *for*-dative DOC)
(17)	a. He gave a present to me	(dativizable *to*-dative)
	b. He gave me a present	(dativizable *to*-dative DOC)

Apart from those constructions that are dativizable as both *to/for*-dative and dativizable DOCs, we have also analyzed utterances which do not allow for Dative shift, that is to say, non-dativizable constructions. Examples in (18) and (19) show *to/for*-dative and non-dativizable structures, respectively.

(18) a. I have something for you (non-dativizable *for*-dative)
b. He said that to the mice (non-dativizable *to*-dative)
(19) They called her Snow White (non-dativizable DOC)

In our data classification, we have discarded the following cases: (a) utterances whose *to/for*-PP denotes a locative or temporal meaning, as in (20) and (21), respectively, (b) passive idiomatic expressions such as those in (22), since they are fixed expressions that lack an active counterpart, (c) DOCs which are paraphrazable as one single verb, as in (23), where the constituent *give it a try* can be paraphrased as *to try* since they have a monotransitive nature, (d) *for*-PPs with a proxy meaning, i.e., those constructions where the preposition *for* is paraphrazable as *in exchange for*, such as those in (24) since the PP lacks a recipient connotation, (e) those constructions which do not show a canonical SVOO or SVO+*to/for*-PP order, as in example (25), which illustrates a non-canonical word order DOC whose wh-Od has undergone wh-movement for syntactic reasons; (f) ditransitive structures which subcategorize a *from*-PP, such as those in (26). These structures have been discarded since the PP denotes a source meaning, contrary to the recipient theta role patterns that (non)-dativizable prepositional constructions present in their PP.

(20) *SIM: he drives her to the car
(21) *MEL: who came for your birthday?
(22) *LEO: I am used to it
(23) *MEL: give it a try
(24) *MEL: you traded the plane for the little blue pistol
(25) *MEL: what did he tell you?
(26) *EMM: you learn that from mommy, don't you?

5 Results and Discussion

In order to analyze the relative order of acquisition between dativizable and non-dativizable constructions, we have taken into account three variables, as follows: (a) age of production, (b) language development as measured in terms of MLUw, and (c) the effect of adult input.

5.1 Age of onset of production

This section discusses three different analyses: (a) the age of onset production that the participants display regarding dativizable *to/for*-dative constructions as opposed to dativizable DOCs, (b) the results obtained concerning the first occurrence of non-dativizable structures, and (c) it offers comparative findings between structures that trigger dative shift (i.e., dativizable utterances) and non-dativizable constructions.

It should be highlighted that in order to determine the age of onset of production, we have taken into account the first clear use of dativizable and non-dativizable constructions.

5.1.1 Age of onset of production: dativizable constructions

As illustrated in Table 1, Simon and Leo start producing dativizable *to*-dative DOCs at around 2 years old. In particular, Simon begins to utter them at 2;03.26 as opposed to Leo, whose first constructions appear one month later, that is to say, at 2;05.00.

Examples in (27) show Simon's and Leo's first utterances, both produced with the verb *give*, the ditransitive verb par excellence. Notice also that the twins have not realized the head of the D(eterminer) P(hrase) encoded in the Od.

(27) a. *SIM: Give me tv (Simon, 2;03.26)
b. *LEO: Give me farmer (Leo, 2;05.00)

By focusing on the first occurrences of dativizable DOCs which trigger *for*-dative shift, Simon and Leo, and particularly the latter participant, present a divergent age of acquisition. They start producing dativizable *for*-dative DOCs at 2;11.06 and 3;03, respectively, with a four month difference between them. Examples (28a) and (28b) illustrate the twin's early production of prepositional ditransitives headed by the preposition *for*.

(28) a. *SIM: do you make me a cake? (Simon, 2;11.06)
b. *LEO: who brought me this? (Leo, 3;03.00)

Broadly speaking, the twins have shown a subsequent production of prepositional ditransitives in contrast with dativizable *to/for*-dative DOCs. Particularly, both children start uttering dativizable prepositional utterances at around the age of 3. Nevertheless, an exception has been found in Leo's early production of dativizable *for*-dative DOCs where, as shown in Table 1, his first occurrence correlates with his early production of prepositional ditransitives at around the age of 3. More specifically, and as shown in (29a) and (29b), Simon and Leo start uttering dativizable *for*-datives at 3;01.20 and 3;02.24, respectively, with a month difference between them. In turn, dativizable *to*-dative constructions, as illustrated in (30), were first produced at 3;02.12 by Simon and 3;01.06 by Leo, also showing a month's difference between the twins' output of those structures.

(29) a. *SIM: to make the honey just for me (Simon, 3;01.20)
b. *LEO: take it and the baby for you (Leo, 3;02.24)

(30) a. *SIM: we bought that to you (Simon, 3;02.12)
b. *LEO: give it to the zoo (Leo, 3;01.06)

When focusing on the age of early utterance of dativizable *to*-dative and dativizable *for*-dative prepositional constructions, our findings show that their age of onset production is at around the age of 3. Despite the fact that Simon and Leo start uttering dativizable prepositional structures at around the same age, they show different ages of onset for each construction. As illustrated in (30a), Simon's early dativizable *for*-dative prepositional ditransitives are initially uttered at 3;01.20, preceding his first production of dativizable *to*-dative prepositional constructions at 3;02.12, as illustrated in (31a). Alternatively, Leo shows a reverse order of acquisition between dativizable *to/for*-dative prepositional utterances since he starts producing dativizable *to*-dative prepositional constructions at 3;01.06, as exemplified in (31b), one month earlier than his early utterance of dativizable *for*-dative at 3;02.24, as can be seen in (30b). Thus, the production of dativizable *to/for*-datives goes hand in hand as syntactic analogous prepositional constituents, confirming our H3, as will be discussed in section 6.

(31) a. *SIM: do you make me a cake? (Simon, 2;11.06)
b. *SIM: give me tv (Simon, 2;05.00)

In particular, Simon's early production of dativizable *to/for*-dative DOCs, as illustrated in (29a), repeated as (31a) and (27a) repeated as (31b), respectively, has been observed at around the age of 2, one year earlier than his onset production of non-dativizable DOC at 3;05.12 (example in (32)). It is worth standing out that Simon's early production of dativizable *for*-dative DOCs is found one year later than the utterance of his early dativizable *to*-dative DOC, as discussed in section 5.1.2.

(32) *SIM: we call them blue (Simon, 3;05.12)

However, Leo's production of dativizable *for*-dative DOCs and dativizable *to*-dative DOCs shows a different time frame since he starts uttering the former constructions at 3;03 (as shown in (28b), repeated below as (33a), one year later than his first occurrence of to-dative DOC at 2;05 (as illustrated in (27b), repeated below as (33b)).

(33) a. *LEO: who brought me this? (Leo, 3;03)
b. *LEO: give me farmer (Leo, 2;05)

All in all, and as illustrated in Table 1, dativizable *to/for*-dative DOCs are the dativizable structures produced the earliest by the twins at the age of 2, preceded by the first occurrence of dativizable prepositional utterances, displayed at the age of 3.

Table 1: Age of onset production of dativizable constructions.

	Dativizable			
	DOC		**Prepositional ditransitive**	
	***to*-dative**	***for*-dative**	***to*-dative**	***for*-dative**
Simon	2;03.26	2;11.06	3;02.12	3;01.20
Leo	2;05.00	3;03.00	3;01.06	3;02.24

5.1.2 Age of onset of production: non-dativizable constructions

As illustrated in Table 2, non-dativizable constructions, regardless of their type, begin to be produced at the age of 3. Thus, the age of onset production of dativizable prepositional ditransitives correlates with the early production of non-dativizables. Nevertheless, for the twins non-dativizable prepositional ditransitives and non-dativizable DOCs do not begin to emerge in a parallel way. More specifically, Simon's linear order of the early production of non-dativizables is the following: he starts uttering non-dativizable prepositional *to*-dative constructions at 3;04.28, one month earlier than non-dativizable DOCs (i.e., at 3;05.12) and five months earlier than non-dativizable prepositional *for*-datives (i.e., at 3;09.13). On the other hand, Leo starts producing non-dativizable for-dative prepositional struc-

tures at 3;02.00, eight months earlier than his first non-dativizable to-dative construction (i.e., at 3;10.05). As displayed in Table 2, there has not been any utterance found concerning non-dativizable DOCs across Leo's corpus.

Table 2: Age of onset production of non-dativizable constructions

	Non-Dativizable		
	Prepositional ditransitive		**DOC**
	***to*-dative**	***for*-dative**	–
Simon	3;04.28	3;09.13	3;05.12
Leo	3;10.05	3;02.00	–

Despite the fact that dativizable prepositional ditransitives and non-dativizables start being uttered at around the age of 3 (compare Tables 1 and 2), Simon and Leo display subtle differences in their order of first production. As example (34) shows, dativizable *for*-dative utterances are the first prepositional ditransitives produced by Simon at 3;01.20, as opposed to Leo, who starts uttering dativizable *to*-dative constructions at 3;02.24, as illustrated in (35).

(34) *SIM: to make the honey just for me (dativizable *for*-dative; Simon, 3;01.20)

(35) *LEO: give it to the zoo (dativizable *to*-dative; Leo, 3;01.06)

Likewise, non-dativizable constructions reflect differences in the twins' order of first occurrence. Thus, as exemplified in (36), Simon begins to produce non-dativizable to-datives at 3;04.28, preceding the age of onset production of non-dativizable DOCs and non-dativizable for-datives, as can be seen in (32), repeated here as (37) and (38), respectively.

(36) *SIM: why is the cat saying that to the mice (non-dativizable *to*-dative; Simon, 3;04.28)

(37) *SIM: we call them blue (non-dativizable DOC; Simon 3;05.12)

(38) *SIM: I want one for myself (non-dativizable *for*-dative; Simon, 3;09.13)

On the contrary, as exemplified in (39), non-dativizable *for*-dative constructions start being uttered by Leo at 3;02.00, preceding the first production of non-dativizable *to*-datives at 3;10.05, as shown in (40).

(39) *LEO: thank you for my playdough (non-dativizable *for*-dative; Leo, 3;02.00)

(40) *LEO: you have something to the toad (non-dativizable *to*-dative; Leo, 3;10.05)

As shown in Table 2, non-dativizable DOCs are not reflected in Leo's data, hence comparative results cannot take place regarding these structures in the twins.

In view of the above-mentioned results, dativizable constructions (i.e. prepositional ditransitives and DOCs) are produced earlier than constructions which do not trigger dative shift (i.e. non-dativizables). More specifically, the relative order of early occurrence of both structures in Simon and Leo is illustrated in (41a) and (41b), respectively.

(41) a. Dativizable *to*-dative DOC > dativizable *for*-dative DOC > dativizable *for*-dative > dativizable *to*-dative > non-dativizable *to*-dative > non-dativizable DOC > non-dativizable *for*-dative

(Simon's relative order of first production of (non)-dativizable *to/for*-datives)

b. Dativizable *to*-dative DOC > dativizable *to*-dative > non-dativizable *for*-dative > dativizable *for*-dative > dativizable for-dative DOC > non-dativizable *to*-dative

(Leo's relative order of first production of (non)-dativizable *to/for*-datives)

These results evidence differences between the twins. On the one hand, Leo's early production of dativizable *for*-dative DOCs correlates with his first occurrences of dativizable *to/for*-datives and non-dativizable *to/for*-datives at around the age of 3. On the other hand, Simon displays a correlative age of early occurrence between dativizable *to/for*-datives and non-dativizable constructions (regardless of the type) at around the age of 3. One year earlier, Simon shows a correlation in his first utterances of the block of dativizable DOCs (i.e., dativizable *to/for*-dative and DOC), which differs from Leo's performance since he does not show a parallelism between the production of DOCs. In fact, as discussed in section 5.1.1, he begins to produce dativizable *to*-dative DOCs at 2;05.00, one year earlier than his first utterance of dativizable *for*-dative DOCs at 3;03.00. Furthermore, unlike Simon, we have not found evidence of Leo's production of non-dativizable DOCs; hence, we cannot offer comparative results between the participants regarding these types of utterances.

5.2 Language development

The Mean Length Utterance measured in words (MLUw) has also been used in this study, along with the chronological age, in order to address the twins' language development in correspondence with their production of (non)-dativizable constructions.

As depicted in Figure 1, Simon's first utterances start being developed with an MLU of 3 words, where he produces dativizable *to*-dative DOCs. In fact, as the MLUw of these constructions rises, the production of dativizable *to*-dative DOCs increases, being his most productive stage with MLUw of 4 and 5. Furthermore, although in a less prolific production, Simon also begins to utter dativizable *for*-dative DOCs and dativizable *to/for*-datives. Regarding Simon's linguistic development of non-dativizable constructions, our results show that even though the number of occurrences of non-dativizable *to/for*-datives are not significantly productive, Simon starts producing them with an MLUw of 4. Moreover, as illustrated in Figure 1, no non-dativizable constructions appear in Simon's production.

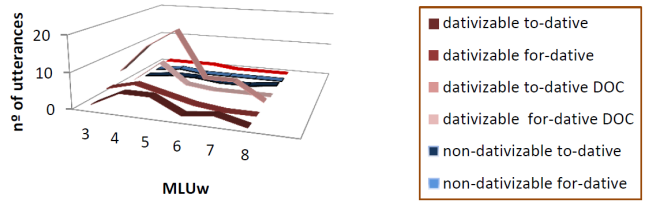


Figure 1: Simon's MLUw of (non)-dativizable constructions.

As shown in Figure 2, Leo starts developing dativizable *to*-dative DOCs which with an MLUw of 3, displaying a correlation with Simon's findings (see Figure 1). Unlike Simon, Leo begins to produce dativizable *for*-dative DOCs and dativizable *to*-datives with an MLUw of 4 and dativizable *for*-datives arise in Leo with an MLUw of 5.

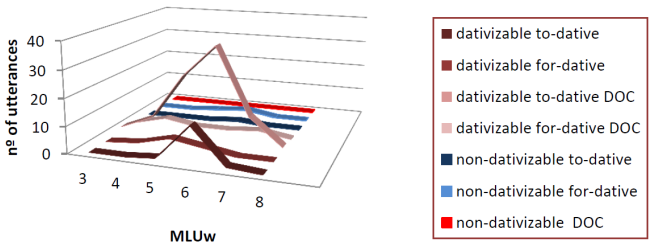


Figure 2: Leo's MLUw of (non)-dativizable constructions.

It must be also noted that Leo has productively uttered non-dativizable *to* and *for* constructions with an MLUw of 5 and 6, respectively. Nevertheless, the number of utterances of these two types of ditransitives is not highly productive.

Overall, and similar to the results found in Simon's production, there was a lack of occurrences regarding non-dativizable constructions in Leo's data.

Therefore, Simon and Leo correlate in the early production of dativizable *to*-dative DOCs with an MLUw of 3. Similarly, the twins show a concurrent lack of productivity in their data concerning non-dativizable DOCs. Despite these correlative results, the early occurrences of dativizable *for*-dative DOCs, dativizable *to/for*-datives, non-dativizable *to/for*-datives and non-dativizable DOCs have shown differences in the twins' production from the point of view of the MLUw (compare Figures 1 and 2).

Table 3 summarizes the linguistic development in both children taking into account the variables of the age of onset production and the MLUw.

As illustrated in Table 3, Simon and Leo show a correlation in the age of onset production of dativizable *to*-dative DOCs at 2;03 and 2;05 years old, respectively, and with an MLUw of 3. However, the age of onset differs in the twins' production of non-dativizable constructions. Simon starts uttering non-dativizable *to*-datives at 3;04.28 whereas Leo begins to produce non-dativizable *for*-datives at 3;02.00. Despite these differences in the age of first occurrence as well as the type of non-dativizable structures, the syntactic status of the object complement being produced is the same for both since, for both participants, a PP headed by a preposition *to* or *for* begins to emerge.

Table 3: Simon and Leo's language development of (non)-dativizable utterances

	Age of onset production		**MLUw**	
	Dativizable	**Non-dativizable**	**Dativizable**	**Non-dativizable**
Simon	*to*-dative DOC (2;03.26)	*to*-dative (3;04.28)	*to*-dative DOC (MLUw 3)	*to*-dative (MLUw 4)
Leo	*to*-dative DOC (2;05.00)	*for*-dative (3;02.00)	*to*-dative DOC (MLUw 3)	*for*-dative (MLUw 6)

Conversely, our results cannot correlate the twins' age of first production and their language development as far as the production of non-dativizable constructions is concerned. Simon starts producing non-dativizable *to*-dative utterances with an MLUw of 4, whereas Leo begins to utter non-dativizable *for*-datives with an MLUw of 6. Furthermore, this lack of correlation goes hand in hand with the type of non-dativizable structure produced the earliest. Thus, even though the syntactic status of the PP is shared in the first occurrences of non-dativizable constructions in the twins, the age of production and the MLUw differ between the participants.

Therefore, the MLUw only differs from the age of acquisition in the production of non-dativizable structures. Conversely, the first production of dativizable structures (i.e. dativizable *to*-dative DOCs) has displayed a correlation between the age of onset production and the MLUw.

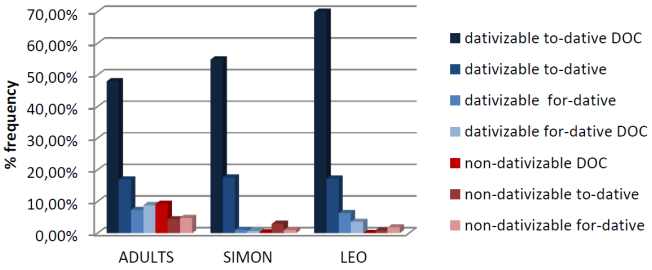


Figure 3: Children's (non)-dativizable utterances and their input.

5.3 The effect of input

The twin's input frequency could determine the twins' relative order in the production of (non)-dativizable constructions. In other words, child-directed speech could shape the children's output. A total of 1233 (non)-dativizable occurrences have been analyzed in the adults' speech as opposed to 102 and 110 (non)-dativizable utterances in Simon's and Leo's data, respectively.

As illustrated in Figure 3, the high input frequency shown in the production of dativizable *to*-dative DOCs by the adults (48.26% out of the total of (non)-dativizable utterances) is projected in the twins' high output of these structures (that is to say, 54.9% in Simon and 70.0% in Leo). Regarding Leo's production of dativizable *to*-dative DOCs, we observe that, compared to the adult input frequency, he shows a higher frequency in the production of these structures.

In turn, Simon and Leo also display a correlation between the relatively high adult input of dativizable *to*-dative constructions (i.e. 16.95%) that they receive and their relatively high output (i.e. 17.65% in Simon and 17.27% in Leo). Similarly, the low adult frequency that the twins receive regarding dativizable *for*-dative DOCs and dativizable *for*-datives goes hand in hand with the twins' low or null incidence of these structures. More specifically, 7.38% occurrences are observed in the adults' production of dativizable *for*-datives in correspondence to 1.05% and 6.36% in Simon's and Leo's output, respectively. Similarly, in correlation to the low adult input frequency of dativizable for-dative DOCs (i.e. 8.84%), Simon and Leo display 0.65% and 3.64% structures, respectively.

As far as the output of non-dativizable constructions is concerned, we can point out that low adult input frequency observed in these structures correlates with the children's low output. In fact, the low rate being observed in the adult input regarding non-dativizable *to*-datives (4.46%) and non-dativizable *for*-datives (4.87%) corresponds with the twins' low and null incidence in their output (i.e. Simon has displayed 2.94% and 0.98% occurrences of non-dativizable *to*-datives and non-dativizable *for*-datives, respectively, as opposed to Leo, who shows a rate of 0.98% occurrences for non-dativizable *to*-datives and a rate of 1.82% utterances of non-dativizable *for*-datives).

All in all, and taking into account the results obtained in Figure 3, adult input and children's output seem to be perfectly matched for this area of grammar.

6 Conclusion

This paper presents the differences that English dativizable and non-dativizable constructions display in the production of English/Spanish simultaneous bilingual children. Our results indicate that Simon and Leo show a tendency toward uttering dativizable *to*-dative DOCs at an earlier stage. In particular, Simon starts producing them at 2;03.26, two months earlier than Leo, who generates his early dativizable *to*-dative DOC at 2;05.00.

However, there are divergences in the twins' first occurrence of dativizable prepositional production in comparison with their early utterance of dativizable DOCs (both to and for dative DOCs) (see Table 1 in section 5.1.1). On the one hand, Simon starts uttering dativizable *to/for*-dative DOCs at around the age of 2, one year earlier than dativizable *to/for*-datives. Simon's findings confirm hypothesis 1 in that the later production of dativizable *to/for*-datives suggests that these structures could be transformationally derived from dativizable *to/for*-dative DOCs via a passive-like process (Aoun & Audrey Li, 1989; Snyder & Stromswold, 1997). On the other hand, Leo's production of dativizable *to/for*-datives arises earlier than dativizable *to*-dative DOCs. However, the delay in Leo's production of dativizable *for*-dative DOCs at 3;03.00 in relation to the first occurrence of dativizable *to*-dative DOCs at 2;05.00 and dativizable *to/for*-datives (at 3;01.06 and 3;02.24, respectively) illustrates contradictory results with Simon's data. In other words, Leo's results suggest that dativizable *to/for*-dative constructions are derived from dativizable *to*-dative DOCs via NP-movement, supporting hypothesis 1, as well. Nevertheless, Leo's correlation in the production of dativizable *to/for*-datives and dativizable *for*-dative DOCs at around the age of 3 infers that dativizable *for*-dative DOCs and dativizable *to/for*-datives are derived from dativizable *to*-dative DOCs via a passive-like process. Hence, due to the differences observed in the twins, further research is required to investigate the syntactic derivation of dativizable *for*-dative DOCs.

Furthermore, our findings have displayed a correlation in the first production of dativizable *to/for*-datives at the age of 3 (see Tables 1 and 2). Despite the fact that previous works have considered *to*-PPs and *for*-PPs as having an argument and an adjunct status respectively (M. C. Baker, 1997; Chomsky, 1955; Hudson, 1997; Larson, 1988, 1990), our results confirm our hypothesis 3 in that both PPs are regarded as a syntactic block of prepositional object constructions.

Taking into account the semantic status of dativizable utterances, Simon and Leo's later production of dativizable *to/for*-datives at around the age of 3 as opposed to their earlier utterance of dativizable *to*-dative DOCs at around the age of 2 confirms hypothesis 4 in that the delay in generating dativizable prepositional constructions may go hand in hand with the requirement of an additional constituent (mainly, the lexical item *to/for*) in order to meet semantic motion requirements (cause-GO). However, Leo's first occurrence of dativizable *for*-dative DOCs cannot support hypothesis 4, as opposed to Simon's data, because Leo starts uttering cause-HAVE structures headed by the preposition for (i.e., dativizable *for*-dative DOCs) at around the age of 3, showing a correlation with his early production of dativizable *to/for*-datives (or cause-GO structures). Hence, despite Leo's performance of dativizable *for*-dative DOCs, we can observe that, as shown in the results confirmed in hypothesis 1 and 4, the later production of dativizable *to/for*-datives could determine that they are syntactically derived structures from dativizable *to/for*-dative DOCs and along with their intrinsic semantic conditions.

Likewise, semantics plays a role in the first occurrence of dativizable and non-dativizable constructions that share a semantic analogy. We have observed in our results a correlation between the early production of dativizable and non-dativizable *to/for*-datives at around the age of 3, which confirms our hypothesis 5. Thus, we can claim that (non)-dativizable *to/for*-datives are considered as a semantic block, implying a cause-GO relation. On the other hand, the differences observed in the age of first production between (non)-dativizable *to/for*-dative DOCs suggests that non-dativizable DOCs cannot be treated as a semantic block as of constructions which denote a cause-HAVE relation. However, because of Leo's absence of evidence of non-dativizable DOCs in his production, it leads to inconclusive results regarding the semantic categorization of (non)-dativizable DOC structures.

Moreover, we cannot firmly assert that non-dativizable constructions are produced later than dativizable structures since the twins have displayed differences in their production. In particular, only Simon's data can confirm hypothesis 6 in that he starts uttering dativizables earlier than non-dativizables. However, Leo cannot support this hypothesis because the production of his first non-dativizable *for*-dative is found earlier than his first production of the two types of dativizable constructions, mainly, dativizable *for*-datives and dativizable *for*-dative DOCs.

Adult input plays a crucial role in the production of both dativizable and non-dativizable constructions. Thus, hypothesis 7 is confirmed. The twins' early production of dativizable *to*-dative DOCs is explained by the narrow correlation between the input found in child-directed speech and that in the twins' output. Similarly, Simon and Leo's low exposure to dativizable

to/for-datives, dativizable *for*-dative DOCs and non-dativizables reflects their low productivity in their output.

All in all, this study of the first occurrence of (non)-dativizable constructions suggests that dativizable *to*-dative DOCs are the dativizable utterances produced the earliest. They start being uttered by Simon and Leo at around the age 2 with an MLUw of 3. In turn, adult input also correlates with the variables of age of onset and language development; hence, the twins' high exposure to dativizable structures along with the twins' low input frequency of non-dativizable constructions can also explain their output.

The analysis of a broader selection of corpora (both English/Spanish bilingual and monolingual data) is, therefore, necessary so that more standing conclusions can be drawn. Moreover, constructions which are generated by the same syntactic process as dativizable constructions (e.g. passives and DOCs) need further research from the point of view of acquisition.

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