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"Which Came First: The Chicken or the Egg?" Ditransitive and Passive Constructions in the English Production of Simultaneous Bilingual English Children

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This article aims to shed light on the syntactic status attributed to ditransitive constructions—double object construction (DOC) and *to/for*-dative—with respect to which type of structure is syntactically transformed through a process analogous to that of passives. We will do so by providing an analysis of the ditransitives and passives that appear in the English production of a set of English/Spanish simultaneous bilingual twins. Our results show that DOCs start being produced earlier than *to*/*for*-datives. However, the age of onset of passives differs in the children though it is consistently produced later than ditransitives. Likewise, adult input goes hand in hand with the children's production of ditransitives and passives since the high frequency of DOCs in this input, as opposed to the low frequency of *to/for*-datives and passives, is reflected in child output. These findings thus suggest that *to/for*-datives could be said to be derived from DOCs although, given the later acquisition of passives, no firm conclusions can be drawn as to whether this is done via a passive-like process.

Keywords: ditransitives; double object constructions; *to*/*for* dative structures; passives; bilingual acquisition; input

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"¿Qué fue primero: el huevo o la gallina?" Las construcciones ditransitivas y pasivas del inglés en la producción de niños bilingües simultáneos

El presente artículo pretende contribuir al debate sobre el estatus sintáctico que se atribuye a las construcciones ditransitivas—es decir, las construcciones de doble objeto (CDO) y las

estructuras de dativo con *to*/*for*—respecto a qué tipo de estructura deriva sintácticamente por un proceso análogo a las construcciones pasivas. Para ello el estudio se centra en el análisis de las construcciones ditransitivas y pasivas en inglés que aparecen en la producción de dos gemelos bilingües simultáneos inglés-español. Nuestros resultados muestran que las CDOs comienzan a producirse antes que las estructuras de dativo. Sin embargo, la edad de inicio de producción de las construcciones pasivas difiere entre los dos niños aunque éstas se producen más tarde que las ditransitivas. Asimismo, existe una correlación directa con el *input* del adulto en la producción de ditransitivas y pasivas ya que la alta frecuencia de las CDOs en él mismo, a diferencia de la baja frecuencia de las estructuras de dativo y pasivas, se refleja en la producción de los niños. Por tanto, estos hallazgos sugieren que las estructuras de dativo pueden verse como estructuras que derivan de las CDOs aunque, dada la adquisición posterior de las pasivas, no se pueden extraer concusiones sólidas sobre si esta derivación se lleva a cabo por un proceso análogo a las pasivas.

Palabras clave: ditransitivas; construcciones de doble objeto; estructuras de dativo con *to*/*for*; pasivas; adquisición bilingüe; *input*

1. INTRODUCTION

The possibility of ditransitive verbs to project their arguments as both double object constructions (henceforth DOCs) and prepositional constructions headed by the prepositions *to* or *for* (henceforth *to*/*for*-datives) has raised an issue as to which structure is syntactically derived via a passive-like process.[1] Examples (1a) and (1b) illustrate how a ditransitive verb such as *send* can subcategorize for a DOC and a *to*-dative. Similarly, as shown in (2a) and (2b), ditransitive verbs such as *buy* can also project their arguments as a DOC as well as a *for*-dative.

(1a) John sent Mary a letter — DOC

(1b) John sent a letter to Mary — *TO*-DATIVE

(2a) John bought Mary a book — DOC

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(2b) John bought a book for Mary *FOR*-DATIVE

Previous work in the field, both within the generative tradition as well as under other approaches to the study of syntax such as relational grammar, point to the derived ditransitive structure being explained in terms of a syntactic transformational process analogous to that of passive constructions. There are authors who claim that DOCs are derived from *to/for*-datives—see Barss and Lasnik (1986), Chomsky ([1981] 1993), Jackendoff (1990), Larson (1988; 2014)—while others argue that *to/for*-dative constructions are generated from DOCs, see Aoun and Li (1989), Dryer (1986), Johnson and Postal (1980), Koizumi (1994), Machonis (1985), Oehrle (1976). There are also studies which have examined the order of acquisition of DOCs and *to/for*-datives in monolingual spontaneous speech data—see Bowerman (1990), Pinker (1984), Snyder and Stromswold (1997). All consistently find that DOCs appear earlier than *to/for*-datives, which suggests that *to/for*-datives might be the derived structure.

The purpose of this study is to untangle the syntactic derivational disagreements that are present in the literature regarding ditransitive constructions and shed light on whether DOCs are derived from *to/for*-datives or vice versa. We will look at the language development of English ditransitive and passive utterances in the spontaneous production of a set of simultaneous English/Spanish bilingual twins in order to determine which type of ditransitive construction appears first in the developmental process and whether the later emergence of the other type of ditransitive coincides with the development of passive constructions. Such an analysis would thus point to the fact that the ditransitive structure that is analogous in grammatical complexity with passives will be the construction derived from its ditransitive source counterpart. We will also consider whether adult input frequency plays a role in the later production of certain types of ditransitives as well as passive constructions.

Our study will make a great contribution to the analysis of the acquisition of ditransitive constructions as, to the best of our knowledge, it is the first study that is concerned with bilingual acquisition data, and also the first to include a comparison between child output and adult input, as well as to consider different developmental stages in the case of child bilingual production. The results of our work could provide a further refinement of the formal proposals that account for the syntactic alternation of ditransitive constructions as it includes a joint analysis between ditransitives and the structure these are syntactically related to in terms of derivation, i.e., passives.

This paper is organized as follows: section two sets out the theoretical and empirical background related to the role that objects and voice play in the construction of passive structures and, linked to this, how passives are connected to the ditransitive construction. It also reviews previous studies on the acquisition of ditransitive and passive structures. The research questions that guide this study are presented in section three. Data selection and classification criteria appear in section four. The results are analyzed in section five, and section six presents the conclusions and suggests directions for further research.

2. Theoretical and Empirical Background: Ditransitive and Passive Structures

2.1. Passive movement and the derived ditransitive as a passive-like structure

Since the derived ditransitive construction—either DOC or *to/for*-dative—has the syntactic status of a passive-like structure, this section will deal with passive movement, in general, and with the passive-like mechanism that is attributed to the derived ditransitive structure, in particular.

Passive movement involves the rearrangement of two theta roles (Comrie 1988; Klammer, Schultz and Della Volpe [1992] 2010; Quirk, Greenbaum, Leech and Svartvik 1985). As shown in (3a), the agent theta role *Thelma*, functioning as the subject (henceforth SU) in the active construction is moved to an adjunct position in (3b), headed by the preposition *by*. In turn, the patient theta role *Louise* functioning as the direct object (henceforth OD) in the active clause in (3a) becomes the subject patient in the passive in (3b). Notice that theta roles are rearranged in the active and the passive constructions but they are assigned to the same arguments in both constructions, albeit that the arguments undergo a change of syntactic function.

(3a)	Thelma will invite	Louise	ACTIVE
	agent	*patient*	[thematic role]
	SU	OD	[grammatical function]
	nominative	*accusative*	[syntactic case]

(3b)	Louise$_i$ will be invited t_i (by Thelma)		PASSIVE
	patient	*agent*	[thematic role]

SU	adjunct	[grammatical function]
nominative	*ablative*	[syntactic case]

(Haegeman and Guerón, 1999: 199)

The derivation of passive voice is also motivated by case theory (Comrie 1988; Haegeman and Guerón 1999). As depicted in (3), the OD *Louise* in (3a) base-generates as the internal argument of the verb in (3b). Due to the fact that the verbal inflection *invited* cannot assign accusative case to its adjacent argument, *Louise* undergoes Noun-Phrase (henceforth NP) movement to SU position, where it receives nominative case from the inflection *will*. As a consequence of this movement, *Louise* leaves a trace (t_i) in its base position; moreover, the preposition *by* assigns ablative case to its adjacent argument *Thelma*. Thus, both arguments—the SU and the adjunct—in the passive voice satisfy the case filter. In other words, NP-movement is case-driven under locality and government conditions since arguments have to be assigned case and theta-role in the minimal domain.

In the case of ditransitive constructions, a passive-like movement has been argued to be behind the derivation of one type of ditransitive from the other. There are linguists who argue that *to/for*-datives, as illustrated in (4a), derive from DOCs of the type in (4b) via a passive-like movement (Aoun and Li 1989; Dryer 1986; Johnson and Postal 1980; Koizumi 1994; Oehrle 1976). These authors combine syntactic and semantic arguments to support the passive-like transformation of *to/for*-datives.

(4a)	They cooked a cake for Sarah	*FOR*-DATIVE	derived structure
(4b)	They cooked Sarah a cake	DOC	source structure

Conversely, there are those who claim that the passive-like derivation of DOCs is motivated by pure syntactic issues that DOCs pose as regards case theory—see Barss and Lasnik (1986); Jackendoff (1972); Larson (1988; 2014). As illustrated in (5a), the verbal head in the small clause (SC) is headed by an empty category (*e*) which cannot assign case to its adjacent argument. Thus, the OD *a book* undergoes NP-movement to the specifier of the SC, leaving a trace (t_i) behind to be assigned accusative case from the verbal head *gave*—as shown in (5b), this position was occupied by the indirect object (OI) *Mary* in the source DOC. The complement *Mary* takes the form of a

prepositional phrase (PP) and occupies an adjunct position, similar to *by*-phrases in passives. *Mary* is assigned dative case by the preposition *to*, satisfying the case filter (Aoun and Li 1989; Koizumi 1994; Oehrle 1976).

(5a) John gave [$_{SC}$ a book$_i$ *e* t_i to Mary]	*TO*-DATIVE	derived structure
(5b) John gave [$_{SC}$ Mary *e* a book]	DOC	source structure

Besides, semantics plays a role in the derivation of *to/for*-datives (Dryer 1986; Johnson and Postal 1980). As shown in (6b), the person to whom a thing is given (*Mary*) takes the primary object (PO) position in the source structure, whereas the thing which is given is assigned a secondary object (SO) position. Thus, *to/for*-datives, as illustrated in (6a), are derived from DOCs as a result of the advancement of the OD to PO and by granting the PP *to Mary* a *chômeur* (or adjunct) position.

(6a) John gave	a letter	to Mary	*TO*-DATIVE	derived structure
	OD (PO)	*chômeur*		
(6b) John gave	Mary	a letter	DOC	source structure
	OI (PO)	OD (SO)		

It has also been argued that DOCs are derived by an analogous syntactic operation to the formation of passives (Barss and Lasnik 1986; Chomsky [1981] 1993; Jackendoff 1972; Larson 1988 and 2014). As illustrated in (7a), the preposition *to*, which assigns dative case to its prepositional complement *Mary* in the source structure in (7b), disappears or is absorbed—still, the debate on the process of prepositional absorption remains open (Larson 1988; 2014). Thus, as the prepositional complement *Mary* is caseless (similar to the internal argument in passives), it triggers NP-movement to the specifier of VP to meet case requirements and it leaves a trace (t_j) behind. In other words, this movement makes it possible for the verbal head *gave*, which has undergone head-to-head movement, to assign accusative case to its adjacent argument *Mary*.

(7a) John [$_{VP}$ gave$_i$ Mary$_j$ t_i t_j a book]	DOC	derived structure
(7b) John [$_{VP}$ gave$_i$ a book t_i to Mary]	*TO*-DATIVE	source structure

The OD *a book* in (7a) occupies an adjunct position, similar to *by*-phrases in passive constructions. However, unlike the optionality of *by*-phrases in passives, the OD in DOCs cannot be suppressed. Also, as opposed to the prepositional complement in passives, which receives ablative case from the preposition *by*, the OD *a book* in DOCs receives inherent case from the verbal trace t_i, thus satisfying the case filter (Chomsky 1986) as well as the Proper Antecedent Condition (Radford 1990). More specifically, since the empty category (t_i) has the same categorial status as its verbal antecedent—the verb (V) *gave*—and the case receiver *a book* is located in the same domain as the verbal case assigner *gave*, then the verbal empty position t_i inherits the case-marking properties from the antecedent V.[2] The NP-movement undergone by the OI *Mary* in (7a) is analogous to that of the passive in (3b) as, in both structures, an object is moved to subject position.

These two opposing views as to which is the ditransitive source structure therefore rely on the same type of argumentation since the derivation of the derived structure is achieved by means of passivization. A direct link is established, then, between ditransitives and passives from the point of view of linguistic theory. Our aim in this study is to explore this syntactic correspondence in terms of acquisition data.

2.2 Previous studies on the acquisition of ditransitive and passive constructions

To date, studies on monolingual English acquisition that focus on the syntactic derivational relationship of ditransitives are rather scarce, with the exception of the works by Aimee L. Campbell and Michael Tomasello (2001) and William Snyder and Karin Stromswold (1997). That said, only the latter discusses the syntactic analogy of the derived ditransitive with that of passive constructions.

Snyder and Stromswold (1997) show that there is a lack of correlation in acquisition between *to*-datives and passives, and also between DOCs and passives in L1 English children. Their results refute the arguments of Richard K. Larson, on the one hand, who states that DOCs are derived from *to*-datives via a passive-like process (1988; 1990), and, on the other, of Joseph Aoun and Ye-hui Audrey Li, who claim that *to*-datives are derived from DOCs via a passive-like NP-movement mechanism. Moreover, it has been

[2] For more information concerning the link between binominal structures of the type NP + NP (i.e., DOCs and SCs) and their case assignment properties, see Radford (1990).

argued that the delay in acquisition of DOCs and passives goes hand-in-hand with their non-canonical thematic role patterns, violating the Principle of Direction (Bowerman 1990; Pinker 1984). The thematic role directionality (theme-recipient) of *to*-datives in (8a) is reversed in DOCs (i.e., recipient-theme), as shown in (8b). Similarly, the canonical thematic role patterns in monotransitives, such as the one in (9a), are reversed in passives, as depicted in (9b).

(8a) I	will give	this one	to you	*TO*-DATIVE
agent		*theme*	*recipient*	Canonical thematic role pattern
(8b) I	will give	you	this one	DOC
agent		*recipient*	*theme*	Non-canonical thematic role pattern

(9a) Someone locks	the door		ACTIVE MONOTRANSITIVE
agent	*theme*		Canonical thematic role pattern
(9b) The door is locked	(by someone)		PASSIVE
theme	*agent*		Non-canonical thematic role pattern

This is in line with the Maturational Hypothesis (Borer and Wexler 1987) according to which passive structures, and any structure that triggers NP-movement, as illustrated in (10) below, are not available to a child in the early stages of acquisition; thus, they become accessible later as a result of maturation.

(10) John$_i$ was hit t_i (Borer and Wexler, 1987: 144)

Other studies based on the Maturational Hypothesis have been conducted to determine the age of acquisition of passive constructions (Marinis 2007; Messenger, Branigan, McLean and Sorace 2012; Stromswold 2005). All have found that L1 English children fail to produce passives until the age of six. However, a linguistic study carried out by Steven Pinker, David S. Lebeaux and Loren A. Frost (1987), based on data from the Child Language Data Exchange System database (CHILDES 2013-2017; see also MacWhinney [1991] 2000), found results counter to the Maturational Hypothesis in that L1 English children start producing passives at around the age of three, although they overgeneralize the regular past participle form, as depicted in example (11), from a three-year-old boy:

(11) it's broked (Pinker, Lebeaux and Frost 1987, 203)

Some studies have examined the role that adult input plays in the age of onset of acquisition of ditransitives. Despite the fact that L1 North American English children started producing DOCs earlier (at 2;2)[3] than *to*-datives in Snyder and Stromswold's study (1997), adult input frequency did not predict the stage of acquisition because parents favored the production of *to*-datives over DOCs. More specifically, adults uttered 73.2% of *to*-datives with the canonical ditransitive verb *give*, in contrast with 33%-85% of DOCs.

Nevertheless, these results contrast with those of Campbell and Tomasello's study where a strong correspondence occurred between high adult input frequency of DOCs and the children's early emergence of these structures (2001). It should be mentioned that Campbell and Tomasello's research looked at each verb-type frequency in each of the target constructions, which sheds light on analogous preferences in the children's production of DOCs—except for two children who uttered *to/for*-datives earlier than DOCs, whose mothers had a preference for uttering the former ditransitives.

Overall, the opposing results between Snyder and Stromswold's (1997) and Campbell and Tomasello's (2001) studies may well come from differences in the criteria for the data analysis. In particular, the former examine a single-verb type analysis on the verb *give*, in contrast to the latter who look closely at a wider range of verb types. Thus, the lexical-specific properties of the early acquisition of DOCs might not have been fully captured in Snyder and Stromswold (1997). Besides, the latter focus on the acquisition of DOCs and *to*-datives, unlike Campbell and Tomasello, who also include *for*-datives in their target structures.

3. Research Questions

Taking into account the theoretical accounts and empirical studies on language acquisition above, we have formulated the following research questions:

RQ 1. Which ditransitive construction emerges earlier in the English production of English bilingual children?

[3] Children's years and months are indicated following the CHIld Language Data Exchange System (CHILDES) (see MacWhinney 2000: 34-35) as follows: year;month.

RQ2. Is there concurrent onset of the derived ditransitive and passives such that it could be argued that the derivation is made in terms of a passive-like movement operation?
RQ3. Does adult input play a role in children's output of ditransitives and passives?

In order to characterize the bilingual English children's production of ditransitives and passives and taking into account the three research questions above, four predictions are made:

• Prediction 1. If DOCs of the type (12c) and (12d) arise syntactically from *to/for*-dative structures—(12a) and (12b)—via a passive-like process, then DOCs and passives of the type illustrated in (13a) to (13d) would be expected to have a similar underlying grammatical structure, i.e., DOCs would derive from *to/for*-datives by means of passivization, and, therefore, both DOCs and passives would be expected to appear at around the same age.

(12a) John gave a book to Mary — *TO*-DATIVE
(12b) John bought a book for Mary — *FOR*-DATIVE
(12c) John gave Mary a book — DOC
(12d) John bought Mary a book — DOC

(13a) A book is needed (by the students) — PASSIVE DERIVED FROM A MONOTRANSITIVE
(13b) A book was given to Mary (by John) — PASSIVE DERIVED FROM A *TO*-DATIVE
(13c) A book was bought for Mary (by John) — PASSIVE DERIVED FROM A *FOR*-DATIVE
(13d) Mary was given a book (by John) — PASSIVE DERIVED FROM A DOC

• Prediction 2. If *to/for*-dative constructions, as shown in (12a) and (12b), are derived from DOCs of the type (12c) and (12d) via a passive-like process, then *to/for*-dative constructions and passives would be expected to have similar underlying grammatical structure, i.e., *to/for*-datives would derive from DOCs by means of passivization, and, therefore, both *to/for*-datives and passives would be expected to appear at around the same age.

• Prediction 3. Taking into account the Maturational Hypothesis (Borer and Wexler 1987), we would expect all passives to appear later and to have a lower incidence

than active ditransitives, regardless of whether they are DOCs or *to/for*-datives, given their grammatical complexity.

• Prediction 4. If adult input plays a role in children's production of ditransitive and passive constructions, then their distribution in children's output would mirror the one in adult input, and this would be so regardless of, or in addition to, the syntactic derivation and the complexity of the structures.

4. METHODOLOGY

4.1 Data selection

We have selected data from a set of English/Spanish simultaneous bilingual twins (Simon and Leo), taken from the FerFuLice corpus,[4] available in the CHILDES database (CHILDES 2003-2017; see also MacWhinney [1991] 2000). The age range covered goes from 1;0 to 6;5 years old and for this study the corpus has been analyzed in its entirety. The parents address the children using the one-parent one-language strategy and so the mother, Melanie, engages in conversations with the children in English as she is a native English speaker, whereas the father, Ivo, addresses them in Spanish, his mother tongue. More information on the children's background as well as on the data collection process appears in Raquel Fernández Fuertes and Juana M. Liceras (2010).

We have focused this study on the spontaneous production of English active ditransitives (DOCs and *to/for*-datives) and passive constructions, considering both the children's output and the mother's input. Since the previous work of both Snyder and Stromswold (1997) and Campbell and Tomasello (2001) has focused on monolingual

[4] As it appears in CHILDES, The FerFuLice corpus contains longitudinal spontaneous data of a set of English-Spanish bilingual identical twins, Simon and Leo, who were born and bred in Salamanca (Spain). The age range of the children is 1;1-6;11. Data were recorded in naturalistic settings, mainly at home, while the children were engaged in play activities with their parents, other caretakers (their grandparents), investigators (Esther. Juana, Raquel and Tod) and visitors (Emma or Jeff). The mother (Melanie) is a native speaker of American English and the father (Ivo) is a native speaker of Peninsular Spanish. The parents use the one parent-one language strategy to address the children in their own mother tongues: While the mother speaks to the children in English, the father does so in Spanish. The parents speak to each other in Spanish, except when a monolingual English speaker is present or when they travelled to the US for two months. Additional exposure to English comes from the maternal grandparents and from the visits to the US. Further contact with Spanish started when the twins attended daycare for three hours a day since the language of the teachers and other kids was Spanish.

English children, the present study adds the characterization of the acquisition of English ditransitives by addressing the bilingual English context.

4.2 Data classification

Data have been selected and classified according to the type of participant, the mean length of utterance measured in words (MLUw) (see Brown 1973) and the type of structure, differentiating between ditransitives and passive utterances. The MLUw has been computed to measure the participants' language development alongside the production of active ditransitives—both DOCs and *to/for*-datives—and passive constructions in order to determine the stage of onset of production of each, and their incidence across the developmental stages.

TABLE 1. MLUw-age range correspondence

SIMON	MLUw	2	3	4	5	>5
	AGE-RANGE	2;3	2;5	2;11-3;10	3;11-4;10	4;11-6;10
LEO	MLUw	2	3	4	5	>5
	AGE-RANGE	---	2;5-2;10	3;1-3;9	3;10-4;2	4;2-6;10

As shown in table 1, five developmental stages were established for each participant in terms of the MLUw values (2, 3, 4, 5 and >5). Each MLUw stage has an age range correspondence. The chronological age is linked with a similar developmental period in Simon and Leo, despite some month differences between them. For instance, when Simon and Leo reach MLUw4, their ages correspond to 2;11-3;10 and 3;1-3;9, respectively, that is, Simon reaches that stage some months earlier than Leo. In the case of MLUw3 and MLUw>5, a narrow correspondence between the age ranges of both children appears. Thus, the MLUw and the age range exhibit similar developmental and chronological stages in the two participants.

In addition, the data classification procedure encompasses the search for the target structures, namely, ditransitives and passives. On the one hand, ditransitive utterances have been extracted by taking into account the following criteria: (i) verbs that subcategorize for an NP and a PP headed by the preposition *to* or *for* in order to select *to/for*-datives, as shown in (14a) and (14b), and (ii) verbs that subcategorize for two NPs so as to search for DOCs, as depicted in (15).

(14a) SIMON (3;5): to tell it to me *TO*-DATIVE

(14b) SIMON (4;9): I got a surprise for you *FOR*-DATIVE

(15) MELANIE: we're going to teach him a lesson DOC

On the other hand, passive structures have been codified as either passives derived from monotransitives, as illustrated in (16), or as passives derived from ditransitives, as shown in (17). The extraction of passive utterances includes instances where the morphological past participle—both in regular and irregular forms—is preceded by the auxiliaries *be* and *get.* Also, passive structures with a realized agent *by*-phrase as well as those with a non-realized one are considered.

(16) MELANIE: it is broken PASSIVE DERIVED FROM A MONOTRANSITIVE

(17) SIMON (4;4): it is called More Bugs in Boxes PASSIVE DERIVED FROM A DITRANSITIVE

In the data classification procedure, discarded structures include: (i) ditransitive idioms, as illustrated in (18a), since they are fixed expressions that do not reflect a creative use of the language; (ii) ditransitive utterances which do not follow a canonical SVOO or SVO + *to/for*-NP order, as depicted in (18b), where the interrogative sentence word order arrangement may disguise the word order facts we are focused on; (iii) passive constructions with a null auxiliary verb, as shown in (18c); (iv) syntactic patterns of the type NP + PP with a null verb which is not clearly inferred from the context, as depicted in (18d); (v) ditransitive constructions where the PP denotes a locative or a source meaning, as exemplified in (18e) and (18f), respectively, given that the thematic role of the PP does not have a beneficiary role status; and (vi)) ditransitive utterances where, similar to (18e), the preposition *for* has a proxy (or replacement) meaning, as illustrated in (18g).

(18a) MELANIE: give the ball a kick [paraphrazable as *to kick*]

(18b) TOD: what are these called?

(18c) MELANIE: saved by the bell

(18d) MELANIE: peas for L?

(18e) SIMON (3;1): he took him to the zoo

(18f) EMMA: you learn that from mommy, don't you?

(18g) MELANIE: you traded the plane for the little blue pistol

5. ANALYSIS AND DISCUSSION OF RESULTS

In order to establish the syntactic status of the derived ditransitive structure, the purpose of the data analysis is twofold: on the one hand, to determine which type of ditransitive shares common syntactic ground with passives, and, on the other, to analyze which ditransitive structure derives from its ditransitive counterpart. In turn, adult input has been taken into account so as to test whether it plays a role in the order in which ditransitives and passives emerge in the children's production.

5.1 Ditransitives and passives from a language developmental approach

Simon produced a total of one hundred and three 103 cases over the five MLUw stages. As shown in table 2, they include *to/for*-datives, DOCs and passives.

TABLE 2. Simon's ditransitives and passives per MLUw

MLUw	AGE RANGE	*TO/FOR*-DATIVES	DOCs	PASSIVES
2	2;3	0 (0%)	1 (0.99%)	0 (0%)
3	2;5	0 (0%)	1 (0.99%)	0 (0%)
4	2;11-3;10	6 (5.94%)	19 (18.81%)	7 (6.93%)
5	3;11-4;10	0 (0%)	12 (11.88%)	13 (12.87%)
>5	4;11-6;10	2 (1.98%)	28 (27.72%)	14 (13.86%)
TOTAL 103 cases		8 (8%)	61 (59%)	34 (33%)

Considering the total number of cases per structure, DOCs and passives display a higher distribution—59% and 34%, respectively—than *to/for*-datives (8%). Considering the distribution in the different MLUw stages, we can observe that DOCs start being produced at MLUw2, whereas *to/for*-datives and passives do not appear at this stage. However, early on (MLUw2 and MLUw3), there is a low incidence of DOCs—one case in each stage—which amounts to 0.99% out of the total number of target utterances for

that stage. From MLUw4 to MLUw>5, the production of DOCs increases as the MLUw increases.

The onset of production of *to/for*-datives starts later than that of DOCs, that is to say, they begin to be uttered from MLUw4—six cases (5.94%). These constructions are not produced at MLUw5; nevertheless, at MLUw>5, *to/for*-datives are once again produced but they show a low incidence—two cases, which equals to 1.98% out of the total number of target utterances.

Regarding the production of passives, they do not begin to be uttered until MLUw4, concurrently with the onset of production of *to/for*-datives, and later than the onset of DOCs. There is a pattern of increasing frequency of production from MLUw4 to MLUw>5, stage at which passives are highly used.

These findings suggest that, due to the early onset of production of DOCs (MLUw2) compared to that of *to/for*-datives (MLUw4), DOCs could be argued to be the source structure from which *to/for*-datives derive. Moreover, coincidence of the stage of onset of *to/for*-datives and passives (MLUw4) might lead us to consider *to/for*-datives to be derived structures from DOCs via an analogous syntactic mechanism to passives.

As illustrated in table 3, Leo uttered a total of one hundred and thirty cases, including *to/for*-datives, DOCs and passives.

TABLE 3. Leo's MLUw ditransitives and passives per MLUw stage

MLUW	AGE RANGE	*TO/FOR*-DATIVES	DOCS	PASSIVES
2	-	0 (0%)	0 (0%)	0 (0%)
3	2;5-2;10	0 (0%)	5 (3.85%)	1 (0.77%)
4	3;1-3;9	7 (5.38%)	11 (8.46%)	11 (8.46%)
5	3;10-4;2	4 (3.08%)	8 (6.15%)	6 (4.62%)
>5	4;2-6;10	5 (3.85%)	54 (41.54%)	18 (13.85%)
TOTAL 130 cases (100%)		16 (12%)	78 (60%)	36 (28%)

Considering the total number of cases per structure, and similar to the findings for Simon, Leo's DOCs and passives are more common—60% and 28% of total target

utterances, respectively—than *to/for*-datives (12%). Developmentally, the onset of Leo's production of DOCs starts at MLUw3, although they are not highly productive—five cases, which equate to 3.85% of the total number of target utterances. Their frequency then increases as MLUw increases, that is to say, from MLUw4 to MLUw>5. Concerning *to/for*-datives, they begin to be used from MLUw4, later than DOCs, and they show a low frequency: seven cases, which corresponds to 5.38% of the total. Furthermore, passives emerge earlier than *to/for*-datives and concurrently with DOCs. These structures begin to be produced at MLUw3 although their incidence is low—one case, equal to 0.77% of the total.

Therefore, a similar linguistic pattern between the production of DOCs and passives is shown in Leo's data since the use of the two structures increases as the MLUw increases from MLUw3 to MLUw>5. Indeed, there is a similarity in the frequency of production of DOCs and passives, which are more frequent than *to/for*-datives. Particularly, from MLUw3, DOCs and passives increase in productivity, reaching their highest rate at MLUw4. From that stage, both constructions decrease in production until Leo reaches MLUw5. Moreover, in MLUw>5, DOCs and passives increase in production again. In the case of *to/for*-datives, their onset is found at MLUw4, that is to say, later than DOCs and passives, and these structures show a slight decrease in production until Leo reaches MLUw5. Then, the production of *to/for*-datives increases slightly at MLUw>5. In the case of Leo, the parallelism in the stage of onset of DOCs and passives shows that both share an underlying syntactic structure. Likewise, these findings reveal that the later production of *to/for*-datives, compared to that of DOCs, might lead to a consideration of the former structures as constructions syntactically derived from DOCs via a mechanism different to that for passives.

There are clearly individual differences between the two children, particularly related to the onset of production. Despite the fact that Simon and Leo both start producing DOCs earlier than they do *to/for*-datives, DOCs appear earlier in Simon's production, at MLUw2, while Leo begins at MLUw3. Moreover, there is a parallelism in the later production of *to/for*-datives with both Simon and Leo starting to use these structures later than DOCs, at MLUw4. However, there is some difference in the age at which they each start producing *to/for*-datives, with Simon beginning at age range of 2;11 to 3;10, while Leo did not start until 3;1 to 3;9. Furthermore, there is a contrast in the production of passives between the two participants. Specifically, Simon exhibits a concurrent

stage of onset of production between passives and *to/for*-datives, in contrast with Leo who begins to produce passives and DOCs at the same developmental stage.

Nonetheless, despite the fact that Simon and Leo display differences in the onset of production of ditransitives and passives, there is similarity between the two children in their incidence in the different language developmental stages. In fact, both participants show analogous high frequency rates of DOCs—although Leo's productivity is slightly higher than Simon's, 78% and 61%, respectively. Conversely, passives and *to/for*-datives had a lower incidence in both children's production. Nevertheless, the higher productivity of passives compared to *to/for*-datives is not correlated with their hierarchical emergence, since Simon begins to produce *to/for*-datives and passives simultaneously, whereas Leo shows a concurrent production of DOCs and passives.

These results therefore suggest that only *to/for*-datives and passives might be argued to share an underlying syntactic common ground, and consequently, *to/for*-datives could be said to be derived from DOCs via a passive-like mechanism, if we take into account Simon's data. However, even though *to/for*-datives have emerged later than DOCs in Leo's production, we cannot infer that the former structures are passive-like due to the parallelism in the stage of onset of production between DOCs and passives. These contrasting results between the participants would seem to stem from individual differences, and thus, further research is required with a broader selection of corpora in order to clarify the situation.

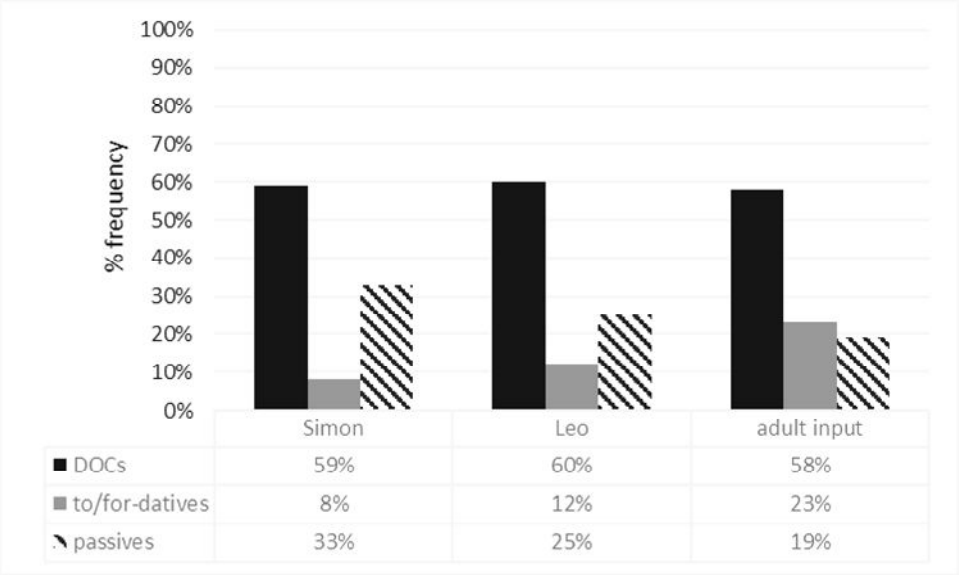
5.2 Adult input effects

Adult input has been taken into account to measure the influence of the frequency with which children hear ditransitive and passive utterances. A total of 1,022 ditransitive occurrences have been analyzed in the mother's speech as opposed to sixty-nine and ninety-four ditransitive utterances in Simon's and Leo's data, respectively. Moreover, a total of 246 passives have been extracted from the mother's speech—235 passives derived from monotransitives and eleven passives derived from ditransitives. Concerning the children's passives, Simon produced thirty-four passives derived from monotransitives, whereas Leo produced thirty-six passives. Neither Simon nor Leo utter passives derived from ditransitives.

As illustrated in figure 1, there is a strong relationship between the adult input frequency that the twins received and their output. More specifically, taking into

account the total number of target utterances for each of the participants (DOCs, *to/for*-datives and passives), the high use of DOCs in the adult input (58%) closely corresponds with the high use of these structures in the twins' output (59% and 60% DOCs produced by Simon and Leo, respectively).

FIGURE 1. Adult input and child output



	Simon	Leo	adult input
DOCs	59%	60%	58%
to/for-datives	8%	12%	23%
passives	33%	25%	19%

Furthermore, the low adult input that Simon and Leo receive regarding *to/for*-datives (23%) corresponds with the children's low output (Simon's 8% and Leo's 12%), as illustrated in figure 1. The pattern in the production of passives also shows a similarity between adult input frequency and the children's high output, compared to that of *to/for*-datives. Adults produce 19% passives, Simon 33% and Leo 28%. Notice that productivity of passives in adult input is slightly lower than that of *to/for*-datives, while the opposite is the case for the children.

These results suggest that the children's order of production corresponds with the incidence of these structures in their input. Hence, the high adult DOC input and low *to/for*-dative and passive input are seen in the incidence of these structures in the twins' output. However, this does not acknowledge the anomaly between the twins' low production of *to/for*-datives, which have a similar input as the passives.

6. CONCLUSIONS

In this study, we have analyzed the spontaneous English production of a set of simultaneous English/Spanish bilingual twins by focusing on their use of ditransitive (DOCs and *to/for*-datives) and passive constructions. Our aim was to determine whether a correspondence could be established between the two ditransitive types—DOCs and *to/for*-datives—and the passive construction in terms of their emergence in the twin's linguistic production, as this could contribute to clarifying the status of the derived ditransitive structure as a passive-like structure. We have also studied whether adult input frequency plays a role in the order of the children's production of ditransitives and passives.

Our results show that, despite there being individual differences in the stage of onset of production, DOCs began to be uttered earlier than *to/for*-datives in the two participants. Thus, these findings suggest that *to/for*-datives are syntactically derived from DOCs, partially confirming our second prediction and rejecting the first one—in line with Aoun and Li (1989), Dryer (1986), Johnson and Postal (1980); Koizumi (1994) and Oehrle (1976). However, opposing results have been found regarding the stage of onset of passives since Simon starts producing *to/for*-datives and passives simultaneously, in contrast to Simon, who starts uttering DOCs and passives concurrently. We cannot therefore draw a firm conclusion as to whether *to/for*-datives are derived via a passive-like mechanism due to the differences in the stage of onset of production of passives in our participants. Further research is needed to clarify the syntactic mechanism that triggers the derivation of *to/for*-datives.

At the same time, we would like to point out that our findings do not seem to follow the same trend as those obtained by Snyder and Stromswold in their analysis of monolingual English data (1997). At this point, we would like to be cautious when comparing their monolingual English data and our bilingual English data as different classification criteria are used in each study and it may be this, rather than, for instance, the so-called bilingual effect, that could be behind the different results.

Despite the language developmental similarity, production-wise, between DOCs and passives, the onset of the two constructions differs in the twins' data. Specifically, Simon starts producing DOCs at MLUw2, followed by the onset of *to/for*-datives and passives simultaneously at MLUw4. Leo, unexpectedly, begins to utter passives at MLUw3, as shown in (19), a concurrent stage of onset with that of DOCs, which is earlier than *to/for*-datives at MLUw4. Thus, these findings cannot confirm the Maturational Hypothesis (Borer and Wexler 1987), stated in our third prediction, since

passives are produced earlier than *to/for*-datives in Leo's data and passives start being produced at the same stage as *to/for*-datives in Simon's.

(19) LEO (2;10): That got lost

Our results confirm the fourth prediction that adult input plays a role in the production of active ditransitives and passives. This fact is shown in the strong correspondence between the high input frequency of DOCs that the children receive and their output. Similarly, the low adult input frequency of *to/for*-datives and passives correlates with the children's output. As such, adult input seems to be a facilitator or a trigger for the early emergence of DOCs and the later emergence of *to/for*-datives in both children's production.

Further research on the emergence of ditransitive constructions could take into account a broader selection of both monolingual and bilingual corpora classified using the same criteria. This would ensure that data are comparable and therefore would also shed light on the similarities or differences between the monolingual and the bilingual acquisition of these structures.

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