

On the acquisition of semantic vs pragmatic telicity in child Romanian

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The study investigated the interpretation assigned by Romanian-speaking children to three telic predicate types: semantically telic and pragmatically telic incremental theme VPs, and change of state VPs. The data came from two experiments and two longitudinal corpora. In Romanian, telicity is not overtly marked, and the verb form used to describe event culmination (the *perfect compus*) has a strong perfective interpretation. The results indicated that knowledge of telicity develops gradually, as the child accumulates linguistic experience; moreover, the semantic properties of the verb are crucial. The first experiment showed that the telicity of change of state predicates was detected early, while there was a delay for incremental theme predicates, especially for the pragmatically telic subtype. The analysis of the longitudinal data indicated that pragmatically telic incremental theme verbs were mainly used in atelic predications, both in child speech and child-directed speech, which may explain the high rates of atelic interpretations in comprehension. The second experiment demonstrated that event culmination was regarded as a cancellable implicature for object creation predicates in a scenario where the temporal integration of two events was required. The study provides support for the impact of verbal semantics and of input factors on the acquisition of telicity.

KEYWORDS: incremental theme verbs, change of state verbs, semantic telicity, pragmatic telicity, language acquisition.

1. Introduction

The acquisition of telicity has been a fertile ground for research due to the multifarious nature of telicity and the questions its development raises about acquisition at the syntax-semantics and semantics-pragmatics interfaces. In this study, we investigate the comprehension of telicity by typically developing Romanian-speaking children, taking into account the variability of acquisition outcomes based on the predicate type. The aim of the study (to be elaborated on in section 5) is to investigate whether knowledge of telicity develops at a different pace for different types of verb phrases. To this end, the acquisition of three groups of telic verb phrases will be explored: semantically telic

non-incremental-theme change of state predicates (*open a box*), semantically telic incremental theme predicates (*make an umbrella*), and pragmatically telic incremental theme predicates (*eat a cake*). The data come from two experiments on comprehension, and two longitudinal corpora of Romanian child speech (CS), in interaction with the respective child-directed speech (CDS). Addressing the three types of data simultaneously is an approach which is often lacking in previous studies on the acquisition of telicity and of verbal aspect in general.

A telic interpretation is dependent on verbal semantics, the properties of the direct object or other relevant elements such as goal PPs or aspectual particles. Several questions have been investigated with respect to these components. One of the questions is related to the acquisition of verb semantics, namely the possibility that children benefit from biases facilitating learning. Gentner (1978) put forth the hypothesis of a Manner Bias, which initially makes children regard lexically telic verbs as manner of action verbs (i.e. verbs describing a mode of action without an endstate). However, as Van Hout (2018) argued, a Manner Bias would mean that, at the outset, all verbs are considered manner of action verbs, while research on the comprehension of telicity has shown that children do associate telic predicates to culmination to a great extent. Schulz *et al.* (2001) proposed that children have an “Endstate Orientation”, in the sense that they first focus on verbs that describe “endstate-oriented transitions” or events with an in-built endpoint (i.e., in German, particle verbs such as *aufmachen* ‘open’, in which the aspectual particle *auf* encodes the endpoint). This early focus is assumed to be based on a conceptual orientation towards endpoints (Lakusta & DiFabrizio 2016). Other authors reject the existence of an acquisitional strategy, arguing that sensitivity to telicity develops based on the evidence in child-directed parental speech, under the strong influence of the morphological characteristics of the target language (Bertinetto *et al.* 2015).

A recent strand of research has focused on the acquisition of the interaction between verb semantics and other telicity-relevant constituents. Three main types of predicates have been investigated: (i) particle verbs, (ii) change of state, and (iii) incremental theme predicates. Van Hout (2008a) argued that telicity is acquired faster if it is expressed overtly (either through verbal particles in Germanic, aspectual ‘perfective’ prefixes in Slavic – see Stoll 1998, Vinnitskaya & Wexler 2001 – or reflexive clitics in Romance, with special regard to Spanish – see Hodgson 2001), and, more slowly, if it is derived from the semantic interaction between the verb and the direct object. It was found that children are sensitive to the telicity inducing effect of aspectual particles

from an early age, both for inherently telic verbs such as *auf-machen* ‘open’ in German (Schulz *et al.* 2001, Schulz *et al.* 2002, Wittek 2002) and for ‘compositional’ particle verbs (*auf-essen* in German, *eat up* in English) (Van Hout 1998, Schulz & Penner 2002, Schulz & Ose 2008). This type of overt telicity is considered to be semantically encoded through entailment (Jeschull 2007, Schulz 2018). In addition, Van Hout (2018) relied on the scalar theory of telicity to propose that inherently telic verbs that have an overt marking of the “closed end of a scale” (such as a particle) are acquired faster than lexically telic monomorphemic verbs that do not (i.e. *wecken* ‘wake’ – Wittek 2002).

However, lexically telic monomorphemic change of state predicates (e.g. *break*, *open*) also elicit culminating interpretations quite systematically. Van Hout *et al.* (2017) tested change of state verbs in child Basque, Dutch, English, Spanish and Mandarin (the children were 3- and 5-year-old). With the exception of Mandarin, in all other languages, all age groups, adults included, rejected a perfective sentence with these verbs in situations when the change of state failed to occur.

While children have an early sensitivity to the telicity of change of state predicates, incremental theme predicates are more problematic. Thus, children accept perfective incremental theme telic sentences as descriptions of both complete events and events which develop towards culmination but stop short of reaching the endpoint. If children see a sandwich eating scenario, they may accept the sentence *He ate the sandwich*, even if the sandwich was not fully eaten. This kind of reading was called “non-culminating” by Martin *et al.* (2017), and the term will be used in this paper as well. For instance, Van Hout (1997, 1998) found that Dutch and English-speaking children (aged 3 to 5) accepted telic *eat/drink* simple past transitive sentences for both culmination and non-culmination. This was also noted in child English by Jeschull (2007), Ogiela (2007), and for child German by Schulz & Penner (2002), Schulz & Ose (2008).

Some studies looked for variation between the subtypes of the incremental theme group both in child and adult language. In experimental research on adult language (e.g. Ogiela *et al.* 2014, Wright 2014 for English, Stoicescu 2019b for Romanian), it was found that adults are permissive of non-culmination with some incremental theme predicates, but intolerant of it with others. For instance, verbs of consumption like *eat* and *drink* were frequently allowed in non-culminating scenarios, while verbs like *build* and *fix* were not (Ogiela *et al.* 2014). This variation was accounted for by arguing that, in the adult language, for some predicates, telicity is an obligatory semantic entailment, while, for other verbs, it is an optional pragmatic implicature (Wright 2014).

The studies on child language which looked for predicate effects reported interesting results. Anderson (2017) compared the comprehension of “variably telic” verbs, for which culmination is a pragmatic implicature (*eat, drink, unzip, cut*), to “strictly telic” verbs, which have an entailed endpoint (*build, fix, cross, empty*). He found that English-speaking children (age range 2;7-5;6) did not distinguish between the two types, treating them as if culmination was an optional implicature for both, and thus accepting both strictly telic and variably telic predicates in incomplete situations. Similarly, Ogiela (2007) found no significant difference between the number of telic interpretations assigned to *eat/drink* versus *build/fix* predicates in child English (age range 3 to 6).

Some studies compared incremental theme and change of state predicates, and found that the former class was seen as more ambiguous than the latter. García del Real Marco (2015) reported that 5-year-old Spanish-speaking children assigned non-culminating interpretations to incremental theme VPs about one third of the time, but almost never to change of state predicates.

This is the first study that focuses on the acquisition of telicity in Romanian, a language which deserves attention for several reasons. First, in Romanian, telicity is mostly expressed compositionally, in a covert manner. Romanian does not have a Slavic-like aspectual system with distinct overt marking. Therefore, the acquisition of telicity is not a precondition that Romanian children have to fulfill in order to be able to use the verbs of the language appropriately. Moreover, unlike Germanic languages, Romanian does not use aspectual particles or prefixes as overt markers of telicity. Since telicity is covert, its acquisition is likely to be a gradual process, which starts with predicates with non-ambiguous semantics, followed by incremental theme predicates.

Second, another point of interest is the verbal form that is usually used in the literature to describe events that culminated. In English, it is the past tense, which allows imperfective readings (see section 4). In Romanian, it is a perfect form, the *perfect compus*, which, unlike the English past, has a strong perfective meaning, only allowing imperfective readings in very restricted contexts (see section 4).

Third, there are not enough experimental studies on the comprehension of event culmination in child Romance languages (other Romance languages studied were child Spanish and Italian – see Hodgson 2001, García del Real Marco 2015 for Spanish, and Van Hout 2008b, Bertinetto *et al.* 2015 for Italian; Van Hout *et al. forthcoming* for both languages). Studying child Romanian can uncover similarities and divergences in the telicity acquisition path between languages in the same and in typologically comparable language families.

This study is a multi-perspective paper with two points of innovation. It distinguishes between two groups of telic incremental predicates in a Romance child language, and it investigates their acquisition not only experimentally, but also in longitudinal corpora, and in comparison with CDS (which is not identical with what one finds in grammars, dictionaries and adult corpora). The focus of the present study cannot be on crosslinguistic comparison, due to methodological differences from previous work (see section 6). However, it can offer an indication as to the direction of future systematic cross-linguistic work on the acquisition of various groups of telic predicates.

The structure of the paper is the following: in section 2, we describe the general mechanisms of telicity and the various types of telic predicates. Sections 3 and 4 discuss telicity and the *perfect compus* in Romanian; section 5 reviews the main accounts of the acquisition of telicity and presents the research hypotheses for child Romanian; section 6 describes the two experiments, and presents the analysis of the longitudinal data; section 7 discusses the findings, while section 8 concludes the paper.

2. Telicity and its guises

A basic distinction used in aspect research is that between grammatical and lexical aspect, which are independent categories that interact (Smith 1997, Bertinetto & Delfitto 2000). Grammatical aspect encodes the viewpoint taken by the speaker in his description of the event, which can be perfective or imperfective. In the perfective, the event is temporally closed, and included in a time of reference (Klein 1994), while the imperfective takes a partial view of the event, and assigns it an open interpretation.

Lexical aspect oppositions (telic-atelic, stative-dynamic) derive from the lexical semantics of the verb and the properties of its arguments. Intuitively, telic sentences describe events that have an inherent endpoint (*He built a bridge*), while atelic sentences refer to events that do not have an endpoint (*He cried*). One of the concerns of lexical aspect is thus the presence or absence of inherent eventuality boundaries, while grammatical aspect deals with the boundaries of the temporal traces of eventualities. Telicity can be calculated at the V, VP, and IP level (Rappaport Hovav 2008, Filip 2004). IP level tense/grammatical aspect operators may coerce the aspectual interpretation of the VP (Smith 1997) (e.g. the explicit marking of the progressive detelicizes telic predicates).

Several semantic accounts of telicity have been put forth. In the mereological account, telicity was described using the notion of quantization (Krifka 1992, a.o.). Telic predicates are quantized: no proper part of building a bridge is an event of building a bridge. By contrast, atelic predicates are not quantized – any proper part of a crying event is still an event of crying.

In scalar accounts of telicity, telicity is equated to reaching a bounded value for a change in a scalar perspective. Hay, Kennedy & Levin (1999) argued that deadjectival degree verbs (*widen*, *lengthen*) denote events in which the affected argument undergoes a change in the scalar property introduced by the base (width for *widen*, etc.). The affected argument possesses the relevant property to a certain extent at the beginning of the event, and to a different extent at the end. If the difference between the two values is regarded as bounded, the predicate is assigned a telic reading (*They widened the road by 1 m*). Several authors (Hay, Kennedy & Levin 1999, Kennedy & Levin 2008) argued that this analysis can be extended to other types of predicates (e.g. verbs of consumption and creation), whose internal arguments are associated with a gradable property, namely “spatial extent”. For instance, for predicates such as *mow the lawn*, the relevant property is a spatial area, for *eat a cake*, the volume of the cake. For a telic interpretation, the measure of the change that occurs during the event has to be bounded. A count noun yields the boundedness of the property associated with the predicate and suggests an endpoint for the event. A mass noun does not introduce a maximal value for the measure of change expressed by the predicate, and the interpretation is that the event does not culminate.

Telic predicates can be classified in several ways. In some instances, telicity is embedded in the lexical semantics of the verb (*He died*) (Rappaport Hovav 2008). For such cases, the term “inherent telicity” was used (Van Hout 1997, Schulz 2018). In other cases, telicity is derived compositionally, with the contribution of the arguments of the verb and other constituents. For instance, looking at English, quantized internal arguments elicit a telic interpretation (*He smoked two cigarettes*), while non-quantized mass or bare plural DPs elicit an atelic interpretation (*He smoked cigarettes*) (Verkuyl 1993, Dowty 1979). Aspectual particles and Goal PPs also elicit a telic interpretation (the sentences *He ate up the cake* or *He carried the bag to the door* are telic).

Another question is whether the telic interpretation is obligatory or optional, and in the latter case, preferred or dispreferred. It has been repeatedly claimed that a distinction can be drawn between semantic or strict telicity and pragmatic or variable telicity (Jeschull 2007, Wright 2014, Anderson 2017, Schulz 2018). For predicates characterized by

semantic telicity, a perfective sentence entails culmination, and the entailment cannot be cancelled (1). For predicates with pragmatic telicity, culmination is a conversational implicature, which can be cancelled (2a) or strengthened (2b) (Wright 2014).

- (1) a. *He built a bridge *but not completely.*
b. *He found a job *but not completely.*
- (2) a. *Lucy ate a cookie, but not completely.*
b. *Lucy ate a cookie and she ate all of it.*

Because pragmatic telicity can be cancelled, predicates in this category admit both telic and atelic interpretations. Telic readings emerge when interpreters draw the relevant implicature. According to Wright (2014), this move is motivated by the maxim of quantity (Grice 1975). Given that count DPs refer to whole objects, sentences where the incremental theme is a count DP are taken to refer to events in which the whole object is affected. If pragmatically telic predicates allow atelic interpretations, then they may be used to describe events that have not reached completion.

A natural question is which are the telic predicates that also allow atelic interpretations. One extensively discussed subclass is that of “degree verbs” (Civardi & Bertinetto 2015) such as *lengthen*, *increase*, *widen*. According to some authors (Kennedy & Levin 2008, Hay, Kennedy & Levin 1999), such verbs allow both telic and atelic interpretations, while, in other accounts, they always have telic properties (Civardi & Bertinetto 2015).

Another relevant subclass is that of incremental theme predicates. An incremental theme is an argument that introduces a homomorphic relation between itself and the event. Parts of the entity denoted by the theme argument are mapped onto parts of the event. With each sip taken from a glass of milk, the event of drinking a glass of milk advances towards its culmination. The incremental theme may be delimited or not (for instance a count indefinite DP such as *a ladder* refers to an object with clear boundaries, while the mass noun *milk* is not delimited). The predicates that involve delimited or non-delimited incremental themes denote bounded or unbounded events respectively. In Krifka’s terminology, a delimited incremental theme argument is quantized. This means that none of the subparts of the object it denotes can count as the object itself. Given the correspondence between the event and the incremental theme, for a telic predicate, none of the parts of the event or its subevents can count as the event itself.

One disputed point is whether, for incremental theme predicates, culmination is entailed or implied. Wright (2014) argued that some predicates evince semantic telicity, while, for others, telicity is pragmatic. He

observed that some incremental theme predicates dubbed “flexible accomplishments” (*sew a dress, drink a cup of coffee, eat a sandwich, write a story*) were systematically accepted in incompleteness scenarios by adults, while VPs such as *create a report, make a hat* (“strict accomplishments”) were systematically rejected. Wright (2014) concluded that telicity was pragmatic for the former and semantic for the latter predicates.

By contrast, Rappaport Hovav (2008), Filip (2017) claimed that culmination is an implicature for all incremental theme predicates. In addition, Civardi & Bertinetto (2015) argued that telic predicates have both a “maximal telos”, and a contextually established “standard telos”. If the “standard telos” is close enough to the “maximal telos”, the predicate holds when the “standard telos” has been reached, even though the maximal telos has not been attained. In this framework, a non-culminating interpretation is elicited when the “standard telos” is not reached.

There is a tension between the proposals in Wright (2014) and Filip (2017). The latter account predicts that all incremental theme predicates should permit non-culminating readings in the adult language. However, this prediction is not borne out by truth value judgment experiments, where only *some* incremental theme predicates are accepted in non-culminating event scenarios (Wright 2014, Ogiela *et al.* 2014, Arunachalam & Kothari 2011, Stoicescu 2019b).

One reviewer suggested that adults assign a telic interpretation to all incremental theme predicates as a result of a probabilistic pragmatic judgment and, for some predicates, this probability is lower, while, for others, it is 100% (inducing the idea that telicity is entailed in this case). One argument for this notion might be the fact that there is a percentage of cases in which the alleged semantically telic incremental theme predicates are accepted in non-culmination scenarios. However, this percentage is generally small across studies. Moreover, a similar small rate of acceptance of non-culmination may also appear for predicates for which there is a consensus that their telicity is semantic (particle verbs were also accepted in incomplete situations 22% of the time by English adults in Jeschull 2007). At the same time, if telicity was an implicature for all incremental theme predicates, then the implicature could be easily cancelled for all of them, but sentences with semantically telic predicates such as those in (3) show that it is not.

- (3) a. **Samara made a box, paused to read the instructions, then resumed making it.*
b. **Samara made a box for a couple of minutes, but soon grew bored and stopped.*
(examples from Wright 2014)

For the purposes of this paper, we will then assume that Wright's distinction between culmination-entailed vs culmination-implied incremental theme predications holds.

Another class of telic predicates involves a change of state which does affect the internal argument, but not incrementally – the change cannot be divided into discrete stages or subevents (Dowty 1991: 568) (*open a box, close a bottle*).¹ The change has only two values – absence or presence of a result state. These predicates are inherently bounded, telicity being lexically specified (Rappaport Hovav 2008: 20). Such verb phrases entail culmination in the past tense (Rappaport Hovav 2008), and instantiate semantic telicity.

The telicity of a predicate can be checked using various diagnostics, such as compatibility with adverbials or entailment patterns. These diagnostics will be presented in detail with Romanian examples in section 3 below (for comprehensive reviews of the telicity tests, see Dowty 1979, Filip 2012, Van Hout 2016).

It should be noted that this paper does not uphold the notion that there is a clear-cut categorization of incremental theme predicates into two classes of semantically vs pragmatically telic subgroups. As noted by a reviewer, given the fact that a telic interpretation depends on a wide range of factors, it is more likely that incremental theme predicates form a spectrum, with some verb phrases manifesting telicity saliently, and others constituting intermediary categories, with flexible boundaries. To pull out a clear contrast, for methodological purposes, the two groups tested in this study included predicates that we deemed likely to be placed at the two ends of the spectrum: i.e. systematically associated with culmination or ambiguous between telic and atelic interpretations.

Summing up, we will refer to three subgroups of telic predicates: (i) incremental theme verb phrases for which completion is an entailment (henceforth 'semantically telic incremental theme predicates' or **STIT**); (ii) incremental theme predicates for which completion is a conversational implicature ('pragmatically telic incremental theme predicates' or **PTIT**) and (iii) non-incremental change of state predications, for which culmination is entailed ('semantically telic change of state' or **STCS**).

3. Telicity in adult Romanian

In Romanian, lexical aspect is mostly computed compositionally through the interaction of several factors: the lexical meaning of the verb, the cumulative or quantized reference of its arguments, the gram-

matical aspect feature expressed by the temporal-aspectual inflection, and the semantic properties of adverbial modifiers.

Telicity can be encoded inherently by the lexical meaning of an intransitive (4a) or transitive verb (4b) that denotes a change of state. Telic interpretations are also generated by the use of a quantized internal argument for transitive incremental theme verbs (5a). If the internal argument of an incremental theme verb is a mass or bare plural noun, the interpretation is atelic (5b). Goal PPs can be employed with verbs of motion as delimiters of the event as well, yielding a telic interpretation (6). Romanian does not make use of aspectual particles, as in Germanic languages, or prefixes, as in Slavic and Germanic languages, to encode telicity systematically. Generally, the morphological structure of verbs does not impact the aspectual interpretation.

- (4) a. *Copilul a căzut de pe canapea în două minute/*timp de două minute.*
 Child_{the} has fallen off on couch in two minutes/for two minutes
 ‘The child fell off the couch in two minutes/for two minutes.’
- b. *Copilul a stins lumina în două minute/*timp de două minute.*
 child_{the} has extinguished light_{the} in two minutes/for two minutes
 ‘The child switched off the light in two minutes/for two minutes.’
- (5) a. *Copilul a construit o căsuță/căsuța în cinci minute/*timp de cinci minute.*
 child_{the} has built a little_{house}/little_{house}_{the} in five minutes/for five minutes
 ‘The child built a/the little house in five minutes/for five minutes.’
- b. *Ion a recitat poezie/poezii *într-o oră/timp de o oră.*
 Ion has recited poetry/poems in-an hour/for an hour
 ‘Ion recited poetry/poems in an hour/for an hour.’
- (6) *Maria a coborât scările până la mare într-un minut/*timp de un minut.*
 Maria has descended stairs_{the} up to sea in-a minute/for a minute
 ‘Maria went down the stairs to the sea in a minute/for a minute.’

Telic predicates are felicitous in certain syntactic contexts, which can be used as diagnostics (Dowty 1979, Stoicescu 2013): (i) they are felicitous with *în x* ‘in x time’ rather than *timp de x* ‘for x time’ adverbials; (ii) they can occur as complements of *i-a luat x* ‘it took x time’. Thus, the predicate *construi o căsuță* ‘build a little house’, if interpreted telically, is compatible with the adverbial *în cinci minute* ‘in five minutes’, but not with the PP *timp de cinci minute* ‘for five minutes’ (5a). The same predicate can also appear in the subjunctive mood as the complement of *i-a luat cinci minute* ‘it took him five minutes’ (7a).

By contrast, atelic predicates: (i) are compatible with *timp de x* ‘for x time’ rather than *în x* ‘in x time’ PPs; (ii) cannot occur as complements of *i-a luat x* ‘it took x time’. The atelic predicate *râde* ‘laugh’ is compatible with the phrase *timp de două minute* ‘for two minutes’, while the sentence with the *în* -phrase is not acceptable (7b). The same predicate cannot occur as the complement of *i-a luat două minute* ‘it took him two minutes’ (7c).²

- (7) a. *I-a luat cinc minute să construiască o căsuță.*
 CL.DAT.3SG.M-has taken five minutes SBJV.build.SBJV.3SG a little_house
 ‘It took him five minutes to build a little house.’
- b. *A râs timp de două minute/*în două minute.*
 has laughed for two minutes/in two minutes
 ‘He laughed for two minutes/in two minutes.’
- c. **I-a luat două minute să râdă.*
 CL.DAT.3SG.M-has taken two minutes SBJV. laugh.SBJV.3SG
 ‘It took him two minutes to laugh.’

Telic and atelic predicates give rise to distinct entailment patterns. Firstly, if an atelic sentence holds relative to an interval I, it also holds over all the subintervals of I. If the atelic sentence *Ion a dormit de la trei la cinc* ‘John slept from three to five’ is true relative the interval *de la trei la cinc* ‘from three to five’, it also holds over all subintervals, so it also holds for the interval denoted by the PP *de la trei la patru* ‘from three to four’ (8a) (Van Hout 2016: 588). Telic predicates do not allow this entailment. If a bridge building event occurred from 1995 to 1997, one cannot assert that it occurred from 1995 to 1996 (8b).

- (8) a. *Ion a dormit de la trei la cinc. → Ion a dormit de la trei la patru.*
 ‘Ion slept from three to five.’ → ‘Ion slept from three to four.’
- b. *Ion a construit un pod din 1995 până în 1997. → Ion a construit un pod din 1995 până în 1996.*
 ‘Ion built a bridge from 1995 to 1997.’ → ‘Ion built a bridge from 1995 to 1996.’

Secondly, an atelic predicate like *râde* ‘laugh’ in the *imperfect* , with progressive meaning, elicited by adding adverbials such as *de două minute* ‘for two minutes’ (as Romanian does not have an exact equivalent of the English progressive), entails that the predicate in the perfect form holds (9a). A telic predicate such as *construi un pod* ‘build a bridge’, in a sentence in the *imperfect* with progressive meaning, does not entail that the perfect sentence holds (9b).

- (9) a. *Ion râdea de două minute. → Ion a râs.*
 ‘Ion had been laughing for two minutes.’ → ‘Ion has laughed.’
- b. *Ion construia un pod de o lună → Ion a construit un pod.*
 ‘Ion had been building a bridge for a month.’ → ‘Ion has built a bridge.’

As mentioned in section 2, there is a dispute with respect to the question whether telic incremental theme predicates entail or pragmatically imply culmination. Focusing on adult Romanian, Stoicescu (2019b) found that, in incompleteness scenarios, speakers of Romanian accepted past tense sentences with some incremental theme predicates ca. 50% of the time (e.g. *scrie o scrisoare* ‘write a letter’, *mânca un sandwich* ‘eat a sandwich’, *desena un copil* ‘draw a child’, *picta un portret* ‘paint a portrait’). This indicates that, for these predicates, the idea of culmination is optional, and pragmatically inferred. Other telic predicates were systematically rejected in non-culmination settings (i.e. *face o ciorbă* ‘make a soup’, *repara un frigider* ‘fix a fridge’, *compune un cântec* ‘compose a song’), which suggests that, in these cases, culmination is entailed. Based on these findings, Stoicescu (2019b) argued that the data from adult Romanian supports the existence of semantically telic and pragmatically telic incremental theme predicates, which is instrumental for this paper.

Interestingly, PTIT predicates are acceptable in sentences with *for x time* adverbials and continuations suggesting an interruption (10a), while STIT predicates are not (10b).

- (10) a. *Ion a mâncat un sandwich timp de câteva minute, dar*
 Ion has eaten a sandwich for several minutes but
apoi l-a lăsat pe masă.
 then CL.ACC.3SG-has left on table
 ‘Ion ate a sandwich for a few minutes, but then left it on the table.’
- b. **Ion a făcut un castel de nisip timp de câteva minute,*
 Ion has made a castle of sand for several minutes
dar nu l-a terminat.
 but not CL.ACC.3SG.M-has finished
 ‘Ion made a sand castle for a few minutes, but didn’t finish it.’

Change of state predicates can be distinguished from incremental theme predicates based on their incompatibility with the verb *termina* ‘finish’ (11a). By contrast, both subtypes of the incremental theme class are compatible with it (11b-c).

- (11) a. **Ion a terminat de găsit un pix.³*
 Ion has finished of found.SPN a pen
 ‘Ion finished finding a pen.’
- b. *Ion a terminat de mâncat un sandwich.*
 Ion has finished of eaten.SPN a sandwich
 ‘Ion finished eating a sandwich.’
- c. *Ion a terminat de construit un pod.*
 Ion has finished of built.SPN a bridge
 ‘Ion finished building a bridge.’

4. The Romanian perfect compus

Telicity is generally evaluated in sentences with perfective past verb forms, and this section presents the Romanian temporal-aspectual form that is used to assess telicity, the *perfect compus*. In Romanian, the past tenses conflate both grammatical aspect and temporal information. The go-to past form is the analytical perfect, the *perfect compus*, made up of a reduced auxiliary, based on *avea* ‘have’, and the past participle (Avram 1999).

Despite its perfect form, this construction underwent the “aoristic drift” (Squartini & Bertinetto 2000), and now behaves like a past tense with perfective meaning. This is shown by the fact that, unlike the English perfect, it can co-occur with definite time adverbials (12), and can appear in narratives (13). Romanian has a synthetic past form, the *perfect simplu*, which is now becoming obsolete, except in certain regional dialects. The analytic *perfect compus* has taken over most of the uses of the *perfect simplu*.

- (12) *A dispărut săptămâna trecută.*
 has disappeared week_the last
 ‘He disappeared last week.’

- (13) *Omul a bătut la ușă. Apoi s-a uitat în jur și a scos un șperaclu din buzunar.*
 man_the has knocked at door then RFL.3SG-has looked in
 around and has extracted a lockpick from pocket
 ‘The man knocked on the door. Then he looked around and took a lockpick out of his pocket.’

The main reading of the *perfect compus* is perfective: the event is temporally closed and included in a time of reference (Klein 1994, Smith 1997). As can be seen in (14a-b), continuations that describe the same situation as being in progress at the moment of utterance are generally not possible (Crăiniceanu 2002, Stoicescu 2013). Atelic predicates may allow such continuations, but the latter make reference to a distinct similar event (Smith 1997) (14b).

- (14) a. *A construit o casă. *O construiește și acum.*
 has built a house CL.ACC.3SG.F builds and now/
 *încă o mai construiește.
 still CL.ACC.3SG.F more builds
 ‘He built the house. He is building it now too/He is still building it.’
 b. *Copilul a plâns. *Plânge și acum.*⁴
 child_the has cried cries and now
 ‘The child cried. He is crying now too.’

The strong perfectivity of the *perfect compus* is also demonstrated by its behaviour in stative and habitual contexts. It has a perfective interpretation with states, as shown by the fact that the sentence continuation in (15), which suggests the termination of the state, is allowed. It is also excluded in habitual contexts (16a), a role reserved for the imperfective past (the *imperfect*) (16b). By contrast, the English past tense allows imperfective readings with states (16c) (Smith 1997: 109), and in habitual sentences (16d) (Martin *et al.* 2017).

- (15) A *iubit-o* *pe Maria.* *Acum nu o* *mai*
 has loved-CL.ACC.3SG.F on Maria now not CL.ACC.3SG.F more
iubește.
 loves
 ‘He loved Maria. Now he no longer loves her.’
- (16) a. *Căinele nostru i-a muscat pe copii.* (only non-habitual)
 dog_the our CL.ACC.3PL.M-has bitten on children
 ‘Our dog bit the children.’
 b. *Căinele nostru îi mușca pe copii.* (habitual)
 dog_the our CL.ACC.3PL.M bite.IMPF.3SG on children
 ‘Our dog used to bite children.’
 c. *Jennifer loved John/*was loving John.*
 (i). ... but she no longer loves him now. (perfective reading)
 (ii). ... and she still loves him. (imperfective reading)
 d. *Our dog bit children.*

The Romanian *perfect compus* does not only have purely perfective (or aoristic) past readings, as it also elicits perfectal readings. In a limited number of contexts, it can have an imperfective or “inclusive” interpretation (Squartini & Bertinetto 2000, Bertinetto 1986). The *perfect compus* can elicit the imperfective reading only in the presence of atelic predicates – states (17a), and activities (17b) – and certain adverbials associated with an Extended Now interval (McCoard 1978): *de ieri* ‘since yesterday’, *de două zile* ‘for two days’, *toată viața* ‘all one’s life’. The interpretation in (17a-b) is that the situations hold throughout the lifetime of the subject and at utterance time.

- (17) a. *Toată viața am adorat copiii.*
 all life_the have adored children_the
 ‘All my life I have adored children.’
 b. *Toată viața am muncit din greu.*
 all life_the have worked from hard
 ‘All my life I have worked hard.’

The Romanian *perfect compus* is similar to other Romance perfects – in (Northern) Italian, and French, perfect forms have perfective interpre-

tations regardless of aktionsart, and occur with definite time adverbials, while also allowing “inclusive” imperfective readings in limited contexts (Schaden 2007, Squartini & Bertinetto 2000). In Romanian, there is no competition of the *perfect compus* with another perfective form, as the simple past is obsolete (unlike Spanish, where there is a competition between the simple past and the perfect form, with the latter being used more frequently in perfect-specific contexts).

Summing up, the Romanian *perfect compus* has strong perfective semantics, and it licenses imperfective interpretations only with atelic predicates and a limited set of adverbials. It is excluded from habitual contexts, and it is unambiguously perfective with states.

5. Previous accounts of the acquisition of telicity, predictions and research hypotheses

5.1. Previous accounts

A general conclusion of prior work is that, in Germanic and Romance, children do not only reject but also accept perfective telic sentences for non-culminating events. As mentioned in section 1, children systematically associate particle verbs and change of state predicates with event culmination, while they are more flexible with incremental theme predicates.

Van Hout (1998, 2008a) suggested that “predicate telicity”, based on aspectual particles in Germanic or ‘perfective’ affixes in Slavic languages, involves an overt, one-to-one form-meaning mapping and is acquired fast. On the other hand, “compositional telicity”, based on the semantics of the direct object, is a covert and conflated mapping. This is acquired later because the direct object DP has multiple roles – it is connected to telicity through quantization, and also specificity, through the presence or absence of determiners, and the nature of the determiner (definite/indefinite) (Van Hout 1998, 2008a). Reframing her previous account in scalar terms, Van Hout (2018) shifts the focus from the object to verbal semantics, suggesting that incremental theme verbs designate open scales and thus pose more difficulties in acquisition than verbs associated with closed scales, for which telicity is either expressed overtly (e.g. particle verbs) or is lexically encoded (change of state verbs).

Another recurring idea is that the telic interpretation based on a quantized object of incremental theme predicates is elicited through an implicature and is not obligatory (Schulz 2018, Martin *et al.* 2020). Schulz (2018) stresses that implicatures are not obligatory and, conse-

quently, both children and adults are expected to assign non-culminating readings to incremental theme predicates at high rates (Schulz & Penner 2002, Schulz & Ose 2008).

Martin *et al.* (2020), however, predict a difference between children and adults based on adults' pragmatic competence. According to these authors, the difficulty of incremental theme predicates is due to the fact that the (in)definite object DP can have both maximal and non-maximal readings. Singular (and plural) definite and indefinite DPs allow non-maximal interpretations. When the (in)definite singular DP denoting an incremental theme is given a non-maximal reading, given the homomorphism between the incremental theme and the event, the latter is also interpreted non-maximally, and the predicate holds for the incomplete event. For change of state predicates, the non-maximal readings are not possible because of the absence of a mapping between the event and the direct object. Their meaning is thus invariant and easy to acquire cross-linguistically. The adequacy of the non-maximal reading of the object DP with incremental theme predicates is determined contextually, so knowing when it can be elicited is a matter of pragmatic competence that children lack but adults have.

Another factor that may increase children's tolerance of incompleteness is the semantics of the past tense form. Martin *et al.* (2017, 2020) argued that past tense forms that have both perfective and imperfective readings in the adult language boost the children's tendency to generate non-culminating interpretations across predicate types. Importantly, this includes change of state predicates.

Anderson (2017) explored the distinction between STIT and PTIT predicates in the acquisition of English, and found an over-acceptance of incompleteness with both types of predications. He suggested that, in child language, completion is a non-obligatory implicature for both VP subtypes. Since children find implicatures problematic (e.g. scalar implicatures, Noveck 2001, Katsos & Bishop 2011), they do not draw them here either.

5.2. Predictions for child Romanian

Since, in Romanian, telicity is not overtly marked and is mostly compositional, its acquisition is likely to be a gradual process, in which verbal semantics, as well as input factors play a role. If the telicity of unambiguous predications is acquired first (Martin *et al.* 2020), Romanian-speaking children should have less difficulties with change of state predicates than incremental theme predicates. At the same time, since the Romanian *perfect compus* has a strong perfective meaning,

change of state predicates should elicit low rates of non-culminating interpretations (Martin *et al.* 2020).

With respect to the acquisition of telicity for incremental theme predicates, the previous accounts predict two possible scenarios. Martin *et al.* (2017, 2020) claimed that the culmination maximal reading is an implicature for all incremental theme predicates, which children do not make until a later stage of acquisition. This predicts that all incremental theme predicates should be treated in the same manner: they should all be regarded as atelic at an early age because the completion implicature is difficult, and, as the child's pragmatic competence consolidates, they should be assigned the telic reading. This means that Romanian children should not treat STIT and PTIT predicates differently.

It is conceivable, however, as Wright (2014) argues, that non-culminating readings are only confined to some incremental theme VPs. If so, different types of incremental theme predicates would have distinct paths to acquisition. Assuming that pragmatic inferences are delayed, the acquisition of telicity would be delayed for PTIT predicates relative to STIT predicates. Moreover, assuming that there are some incremental theme predicates which are associated with event culmination earlier than others, a related question would be whether children regard culmination as an entailment or an implicature in this case (Anderson 2017). Another related question is whether there are input factors that come into play.

5.3. Specific research hypotheses

Given the scenarios discussed above, this study addresses the following hypotheses: (a) in child Romanian, the sensitivity to telicity develops early for change of state predicates; low rates of non-culminating interpretations are expected for this predicate type (Martin *et al.* 2020); (b) sensitivity to telicity develops more slowly for incremental theme than change of state predicates; development is gradual and does not follow a uniform route – children distinguish between STIT and PTIT predicates in the sense that predicates with semantic telicity have a stronger association to culmination than predicates with pragmatic telicity; (c) children treat culmination as an implicature, not as a semantic entailment, for incremental theme predicates (Anderson 2017); (d) properties of the input have an impact on the acquisition of event culmination.

These hypotheses will be addressed in two experiments and by investigating two corpora of child Romanian in comparison with CDS. The first two hypotheses (a,b) will be addressed in the first experiment.

The third hypothesis (c) is investigated in the second experiment. The last hypothesis (d) is investigated in the corpus study.

6. The study

The study looked for connections and mutual reinforcement between experimental and longitudinal data. Two experiments tested the comprehension of telicity. The first investigated children's (as compared with adults') tolerance of non-culmination for STIT, PTIT, and STCS predicates. The second experiment explored, using child data and also adult data for control, the nature of the culmination inference as an entailment or implicature, an issue which could not be settled in the first experiment. In both experiments, the participants were expected to make metalinguistic judgments that required great linguistic awareness. In the third part of the study, we investigated the way in which the relevant verbs were used in the longitudinal corpora, both in CS and CDS, which pointed to an explanation for the children's comprehension results in the first experiment.

6.1. Experiment 1

6.1.1. Design and materials

The first experiment used a Truth Value Judgment Task (Crain & Thornton 1998), using the task in Anderson 2017 as a starting point. Unlike Anderson (2017), we did not control for the order of presentation of completed and incomplete events, because our aim was not finding out whether children are influenced by this pragmatic factor.

Twenty-four videos were shown, in which a character performed an act either completely or incompletely. There were two experimental setups, the completion situation, and the incompleteness situation. The test items used the Romanian *perfect compus* and telic transitive predicates with a singular indefinite DP object (18). Three types of telic predicates were tested: a. STIT predicates (18a), b. PTIT predicates (18b), c. STCS predicates (18c). In the completion setup, the congruent answer was acceptance of the test item for all predicate types. In the incompleteness setup, rejection was expected for all categories. One of the reviewers asked why, for PTIT predicates, rejection was expected in the non-culmination condition (not both acceptance and rejection). Adults were expected to draw the culmination implicature systematically with PTIT predicates because this is the preferred reading in adult Romanian.

- (18) a. *Adina a construit o mașină.*
 Adina has built a car
 ‘Adina built a car.’
- b. *Adina a mâncat o prăjitură.*
 Adina has eaten a cake
 ‘Adina ate a cake.’
- c. *Adina a stins o veioză.*
 Adina has extinguished a reading-lamp
 ‘Adina switched off a reading lamp.’

The experiment had six conditions with a 3x2 design. Four predicates were used in each condition. The PTIT predicates were selected based on findings in previous work on adult Romanian, and English (Stoicescu 2019b, Ogiela *et al.* 2014), where such predicates were accepted by adults in non-culmination settings at high rates (around 50%). The STIT predications were chosen among those systematically rejected by adults in non-culmination setups in Romanian and English (Stoicescu 2019b, Anderson 2017, Ogiela *et al.* 2014). All the predicates were transitive, and did not have morphemes with an aspectual role in their structure. We used the indefinite article rather than the definite article for the object DP because, in prior experimental work, it was noted that Romanian adult speakers tended to assign non-culminating interpretations to predicates with indefinite rather than definite DP objects (Stoicescu *forthcoming*). One reviewer asked why we did not vary the tense/aspect form. This was because the focus was not on children’s knowledge of grammatical aspect distinctions rather on their sensitivity to telicity.

Each verb was tested with two direct object DPs. For instance, the participants witnessed an incomplete car building event and a complete umbrella building event. This method had one advantage over the alternative of using the same verb + object combination in both setups. It masked the fact that the task focused on the completion-incompletion contrast (Wright 2014). The predicates tested were the following: a. STIT predicates: *face un puzzle/o pisică* ‘make a puzzle/a cat’,⁵ *construi o umbrelă/o mașină* ‘build an umbrella/a car’, *goli un pahar/o pungă* ‘empty a glass/a bag’, *curăța o banană/o pară* ‘peel a banana/a pear’; b. PTIT predicates: *mânca o prăjitură/un biscuit* ‘eat a cake/a biscuit’, *bea o cană cu suc/un pahar cu apă* ‘drink a cup of juice/a glass of water’;⁶ *desena o masă/un pătrat (o căsuță)* ‘draw a table/a square (a little box – used for the youngest children)’, *picta un copac/o floare* ‘paint a tree/a flower’; c. change of state: *închide o cutie/un borcan* ‘close a box/a jar’, *deschide o cutiuță de bijuterii/o sticlă* ‘open a jewel-box/a bottle’, *stinge o lumânare/o*

veioză ‘extinguish a candle/a reading lamp’, *găsi un pix/o foarfecă* ‘find a pen/a pair of scissors’.⁷

There were 24 test items in total, which were tested in two sessions. To control for item effects, two versions of the item list were compiled, each administered to half of the participants. The two item lists varied the setup (incomplete *vs* completed situation) presented for each predicate and the order of the items. The lists were randomized, and the two variants were counterbalanced. The test items were preceded by two practice items which helped the child get acquainted with the procedure. One reviewer asked how the ‘yes’ bias was controlled for in the absence of control or filler items. While this is a limitation of the study, filler items were not included in order not to make the task too long for the youngest participants (cf. Ogiela 2007: 66). In the practice session, if the children were not able to provide a ‘no’ answer, they were excluded. In addition, the children who displayed a ‘yes’ bias in any of the two sessions, were excluded.

6.1.2. Procedure

The experimenter told the child that Grandma (a puppet) wanted to watch some videos but could not see very well. The child was asked if (s)he wanted to help Grandma. She would tell the child what she had seen in the videos and the child would say whether she was right or wrong. After the video was played, the children heard the target item as a question – an interrogative form/intonation was used because this method elicited a response more successfully than the declarative intonation. The children provided a yes/no answer. Additional confirmation questions were asked, which checked whether the child had noticed the most relevant details in the scene that indicated (in)completion (e.g. *Was there any juice in the cup at the end?*). Care was taken not to suggest the idea of completion in these questions. In the completion videos, the event was carried out to its full culmination (e.g. the object was fully built). In the non-completion videos, for all items, care was taken to make it clear that, while the action had progressed beyond its halfway point, culmination was not attained (for instance, in the car-building video, two pieces of the car were put together and a relatively big piece was left to the side unassembled).

6.1.3. Participants

The participants were 72 typically developing Romanian-speaking children divided into 3 age groups: 3-year-olds (N=27, age range 2;8-3;11, mean age 3;4, SD 3.7, 14 tested with Item list 1, 13 with Item list 2), 4-year-olds (N=26, age range 4;0-4;9, mean age 4;6, SD 2.3, 13 tested with Item list 1, 13 with Item list 2), and 5-year-olds (N=19, age

range 4;10-6;1, mean age 5;5, SD 4.5, 10 tested with Item list 1, 9 with Item list 2). The control group comprised 10 adults. The children were tested individually, in a quiet room.

6.1.4. Results

Table 1 provides the percentages of responses in which the test items were accepted by condition (culmination and non-culmination) and predicate type (STIT, PTIT, STCS). The children's rates of acceptance of the perfective telic sentence in the culmination set-up were very high and similar to adults' rates. However, it is known that, in comprehension experiments, there is a tendency for children to say 'yes', as they find acceptance easy, and rejection difficult (Crain & Thornton 1998).⁸ Thus, their capacity to reject a test item when it does not suit the situation is a salient indicator of its comprehension. Consequently, it is of greater interest how the children performed in the non-culmination condition.

The children's mean rates of acceptance of non-culmination were the highest for PTIT predicates (ranging between 42-47%), and the lowest for STCS predicates (5-13%). Adults also allowed non-culmination (i.e. acceptance of the test sentence) most frequently with PTIT predicates. For STIT predicates, children's acceptance of non-culmination ranged between 28-45%. However, a trend towards the elimination of the non-culminating interpretation emerged with STIT predicates, as the acceptance rate decreased with age. For PTIT predicates, no significant downward trend appeared with age. For STCS verbs, the rates of non-culminating interpretations were low.

Mean age	STIT		PTIT		STCS	
	Culmination	Non-culmination	Culmination	Non-culmination	Culmination	Non-culmination
3;4	94	45	94	47	97	13
4;6	95	33	96	42	99	5
5;5	97	28	96	47	95	9
Adults	100	7	100	17	100	0

Table 1. Acceptance rates for telic predicates across age groups and predicate types (%).

6.1.4.1. Statistical analysis

Before performing the statistical analyses of the data, the assumptions of normality of the outcome variables were checked, through visu-

al inspection of their distributions, as well as by assessing the skewness, and/or the skewness by standard error of skewness ratio – where, for parametric tests to be used, skewness should not exceed ± 1 , while the skewness by standard error of skewness ratio should be below 2 in absolute value (Field 2009). In the first experiment, the data did not meet the parametric test conditions for four outcomes (STIT – culmination, PTIT – culmination, STCS – culmination, and STCS – non-culmination). These distributions were non-parametric due to the fact that most of the participants obtained the maximum scores. Consequently, non-parametric tests were used throughout.

In order to check the effect of age on performance, the Kruskal-Wallis non-parametric test was conducted for all outcomes, with age group as the independent variable (with 4 levels: 3-/4-/5-year-olds/adults), and the participants' scores as dependent variables. There were no significant differences between age groups for STCS-culmination, PTIT-culmination, PTIT-non-culmination, STIT-culmination, and STCS-non-culmination (STCS-culmination: $H(3) = 3.245$, $p = .355$; PTIT-culmination: $H(3) = 4.461$, $p = .216$; PTIT-non-culmination: $H(3) = 6.746$, $p = .080$; STIT-culmination: $H(3) = 4.193$, $p = .241$; STCS-non-culmination: $H(3) = 4.183$, $p = .242$). There was a significant difference between age groups for STIT-non-culmination ($H(3) = 14.947$, $p = .002$). Post-hoc Mann-Whitney tests using Bonferroni corrections were used to compare age groups for this outcome, and the difference between the 3-year-olds and adults was significant ($U(n_1 = 27, n_2 = 10) = 29.500$, $p = .000$). There were no other differences between age groups on this outcome.

The non-parametric Wilcoxon signed rank test was conducted to compare the results to the chance level. The results are presented in Table 2. For 4 conditions (STCS-culmination, STCS-non-culmination, STIT-culmination, PTIT-culmination), the results were significantly higher than the chance level for all age groups. In the STIT-non-culmination condition, the 4-, 5-year-olds, and adults rejected the test item at rates significantly higher than the chance level. The scores of the 3-year-old group for STIT-non-culmination, as well as the scores of all child groups for PTIT-non-culmination were at the chance level. The adults' rejection rates were higher than the chance level in the PTIT-non-culmination condition.

MEAN AGE	STIT		STIT		PTIT		PTIT		STCS		STCS	
	Culmination		Non-Culm.		Culmination		Non-culm.		Culmination		Non-culm.	
	Z	p	Z	p	Z	p	Z	p	Z	p	Z	p
3;4	4.767	< .001	.748	.454	4.786	< .001	.582	.561	5.014	< .001	4.463	< .001
4;6	4.772	< .001	2.714	.007	4.838	< .001	1.170	.242	5.014	< .001	4.767	< .001
5;5	4.243	< .001	2.772	.006	4.146	< .001	.164	.870	4.066	< .001	3.907	< .001
Adults	3.162	.002	2.919	.004	3.162	.002	2.598	.009	3.162	.002	2.972	.003

Table 2. Comparison to the chance level using the Wilcoxon signed rank test (Non-culm. = non-culmination).

The children’s scores for the STIT-non-culmination and PTIT-non-culmination conditions were strongly and positively correlated according to the Spearman’s rank-order correlation ($r_s(70) = .664, p < .001$).

6.1.4.2. Performance for individual PTIT and STIT predicates

Acceptance of non-culmination was generally uniform for three of the PTIT predicates tested (*drink, paint, draw*), with scores ranging between 31-53%; the exception was *eat*, which elicited higher rates of non-culminating interpretations – 47-65% (see Figure 1).

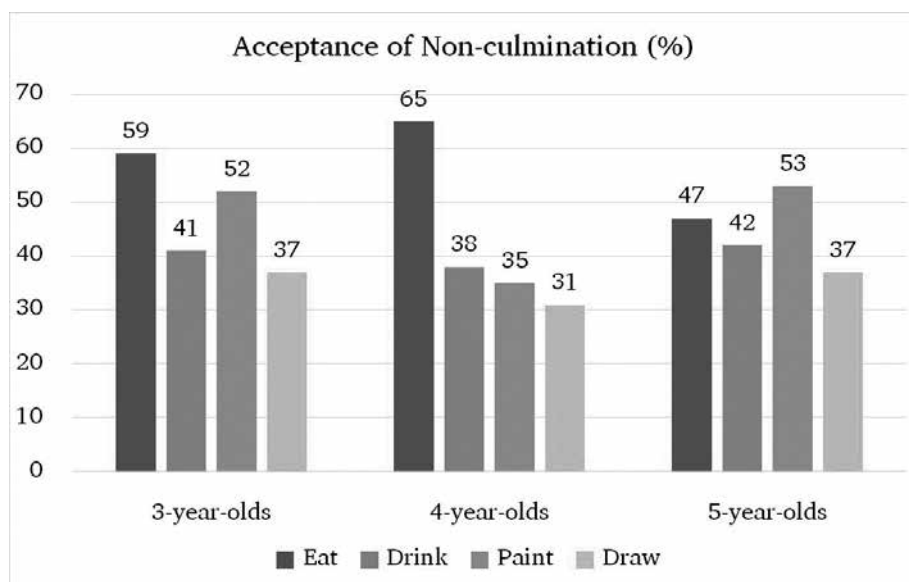


Figure 1. Acceptance of non-culmination for PTIT predicates.

Consider now the children's results for the STIT predicates. When the 3-year-olds had to reject the STIT predications in the non-culmination condition, their scores were significantly lower than those of adults, and similar to their scores for the PTIT predicates. The number of non-culminating interpretations then decreased with age (Table 1). This suggests that children gradually learn that incompleteness should be rejected and that telicity is obligatory for STIT predicates. This trend was not visible for PTIT predicates, for which the scores remained between 42-47% regardless of age (Table 1).

The relatively high frequency of non-culminating interpretations for the STIT subclass at early ages was due to the rates elicited for the verbs *curăța* 'peel' and *goli* 'empty'. As can be seen in Figure 2, these verbs were allowed in the incomplete situation 46-70% of the time by the two younger groups. As one reviewer suggested, the difficulty of *empty* probably stems from its ambiguity between an accomplishment and degree verb reading.

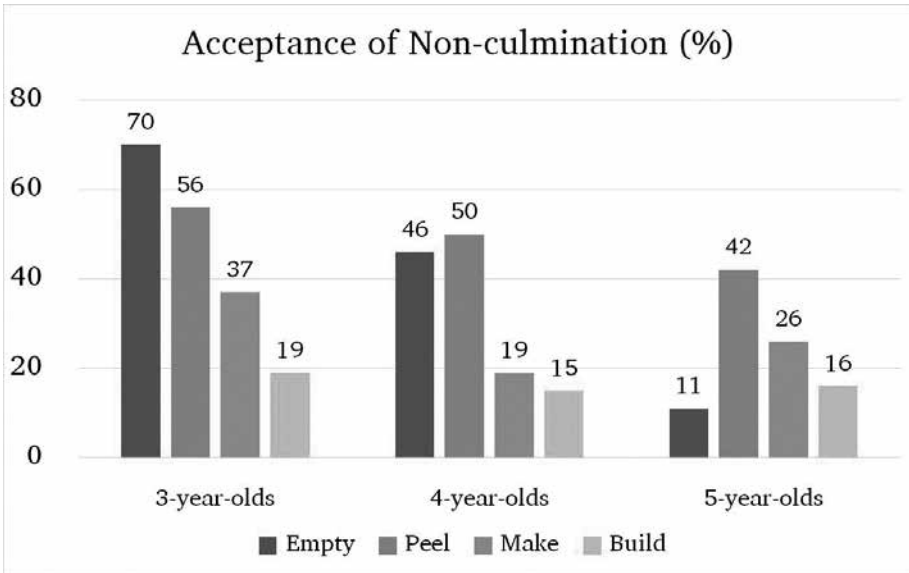


Figure 2. Acceptance of non-culmination for STIT predicates.

The predicates formed with *face* 'make' elicited a high rate of non-culminating interpretations, but this was due to only one of the *make* predicates tested, namely *face un puzzle* 'make a puzzle'. This predicate was accepted for non-culmination 38-62% of the time; it is treated as a PTIT predicate (note, for instance, in Table 3, the lack of development with age).

Make a cat elicited far fewer non-culminating interpretations than *make a puzzle* regardless of age group ($\leq 14\%$, see Table 3). Interestingly, *make a cat* and *build x* were accepted in incomplete situations at levels as low as those found for change of state predicates ($< 20\%$).

MEAN AGE	MAKE A PUZZLE	MAKE A CAT
3;4	62	14
4;6	38	0
5;5	56	0

Table 3. Acceptance of non-culmination for *make a puzzle* vs *make a cat* (%).

This is an important finding, because it demonstrates that not all incremental theme predicates are ambiguous for children, as usually assumed in the literature. Predicates of creation of physical objects elicit very few non-culminating interpretations from age 3;4.

6.1.5. Discussion

The first experiment tested two hypotheses. Since, in adult Romanian, telicity is a covert category, and is, generally, compositionally established, it was hypothesized that it is acquired gradually, and that factors such as verbal semantics play an important part. Thus, it was predicted that, from an early age, children realize that STCS predicates entail culmination, while there is a delay with respect to incremental theme predicates. Moreover, given the strong perfectivity of the *perfect compus*, the expectation was that there would not be a significant percentage of non-culminating interpretations for STCS predicates. These predictions were confirmed. There were very few non-culminating interpretations for STCS predicates, from the earliest age tested, and the rate of such responses decreased with age. At the same time, non-culminating interpretations were a lot more frequent for incremental theme predicates than for change of state predicates, which means that the acquisition of telicity for the former proceeds more slowly.

The second hypothesis was that children differentiate between STIT and PTIT predicates. This hypothesis was also confirmed by the results. Even though both STIT and PTIT predicates elicited non-culminating readings, the rates of such responses went down with age for STIT predicates, and stayed the same for PTIT predicates. The children treated PTIT predicates very flexibly, as their scores were around the chance level regardless of age. These predicates were associated with both completion and incompletion. The distribution of the data was not bimodal: it was not the case that half of the children accepted non-culmination,

while the other half rejected it. Rather the same individual child hesitated between acceptance and rejection. This non-uniform treatment indicated that the children did not regard the predicates as atelic. The fact that the scores did not improve with age suggests that the completion inference is optional between 3;4-5;5 for PTIT predicates formed with the Romanian counterparts of *eat*, *drink*, *paint*, *draw*. The adult group also assigned non-culminating interpretations to these predicates; the difference between adults and children was not statistically significant.

The children's flexibility relative to PTIT predicates is not unexpected if we assume that, for this class of predicates, completion is an implicature (Wright 2014). In child language, implicature generation is delayed in other linguistic domains as well. Stoicescu *et al.* (2015) reported that Romanian-speaking children aged 4;0-6;8 did not draw scalar implicatures, while Bleotu (*forthcoming*) showed that they were drawn at older ages (around age 9). There is some evidence that Romanian children make the completion implicature of PTIT predicates at older ages. In a pilot study run with 3 older Romanian-German bilingual children (age range 8;6-11;6, mean age 10;4), using the task in Experiment 1, performance on all predicate types was at ceiling, including PTIT predicates.

Another interesting point was that the scores on the non-culmination condition were positively correlated, which was confirmed by an inspection of individual response patterns. If the children tended to accept non-culmination with STIT verbs, they did the same with PTIT verbs.

The results of Experiment 1 raise a question about the nature of the completion inference for incremental theme predicates in child Romanian. We have seen that, for some STIT predicates (predicates of creation of physical objects), the inference is made systematically from an early age. This raises the question whether this early judgment is an entailment or an implicature. If it is an implicature, children might find it harder to draw it in contexts where processing demands are higher because of the increased semantic complexity of the test sentence. In order to explore this hypothesis, we set up a second experimental task that posed more processing challenges, by asking children to compute the temporal relation between two events. If children do not draw the completion inference in this context, it means that it is not obligatory for them; hence, they were able to draw it in Experiment 1 because of the lighter computational load.

6.2. Experiment 2

6.2.1. Design, materials, procedure.

The task used in Experiment 2 was a Truth Value Judgment task (Crain & Thornton 1998), a modified replica of Experiment 4 on Russian

in Kazanina & Phillips (2007). We used a methodology that made the task easier to administer. Kazanina & Phillips (2007) acted out the stories with props, while we illustrated them with pictures. The aim was to test the interpretation of perfective incremental theme sentences in a context in which it was necessary to compute the relation between two events. Children listened to stories illustrated with pictures, and evaluated the truth value of related complex clauses. Each narrative included two overlapping eventualities. The first event began before the second event, and stopped while the second event continued. Thus, the second event only finished after the end of the first.

The stories were formulated in the present tense, in order not to expose the children to the tenses used in the test sentence. The Puppet (Grandma), who uttered the test sentence, used a past tense in the introduction, in order to make the past tense in the test item appropriate in the context ('I know what *happened* in the story...'). A sample story is illustrated in (19). The test item is provided in (20a), and the control item in (20b).

- (19) Sample story: *Tata și bunicul sunt împreună. Bunicul vrea sa măture în curte. Își ia mătura și începe să măture frunzele. Tata vrea sa construiască o masă frumoasă. Își ia ciocanul și scândurile, apoi le bate în cuie. Bunicul intră și spune: Am obosit, mă duc să stau în fotoliu, dar masa ta nu e gata. Și se duce să stea în fotoliu, dar tata mai are de lucru. Bate ultimul cui la masă și apoi pune o vază cu flori pe ea. Bunica: Povestea a fost despre tata și bunicul. Știi ce s-a întâmplat: ...*

'Dad and Grandpa are together. Grandpa wants to sweep the yard. He takes his broom and starts sweeping the leaves. Dad wants to build a beautiful table. He takes his hammer and some wood pieces, then nails them together. Grandpa comes in and says: I am tired, I am going to sit in the armchair, but your table is not ready. He goes to sit down, but Dad still has some work to do. He drives in the last nail and then puts a flower vase on the table. Grandma: The story was about Dad and Grandpa. I know what happened: ...'

- (20) a. *În timp ce Bunicul mătura în curte, tata a*
in time what Grandpa sweep.IMPF.3SG in yard Dad has
construit o masă.
built a table
'While Grandpa was sweeping in the yard, Father built a table.'
- b. *În timp ce Bunicul mătura în curte, tata*
in time what Grandpa sweep.IMPF.3SG in yard Dad
construia o masă.
build.IMPF.3SG a table
'While Grandpa was sweeping in the yard, Father was building a table.'

In the test item, the first event (E1) is described in a *while*-subordinate by an imperfective past atelic predicate. The sentence suggests that E1 was ongoing in the past and, due to the atelicity of the predicate, it

did not progress towards a telos. The second event (E2) is described in the main clause by an incremental theme telic predicate in the *perfect compus*. This indicates that E2 reached its inherent endpoint, the emergence of the object. The temporal trace of the event in the *while*-subordinate serves as a reference interval for the second event. The completed event is included in the interval of reference, so that it ends before the right boundary of the reference interval.

In adult Romanian, (20a) suggests that the building event was completed before the (non-asserted) end of the sweeping event. In the scenario in (19), the test sentence should be rejected because the table was finished after sweeping stopped, not before. If the children rejected the test item, it meant that they computed the completion inference of the *perfect compus* incremental theme predicate. If they accepted it, they did so because, in the story, a part of the table building takes place during the sweeping, which amounts to an atelic interpretation.

The story was phrased in such a way as to help the children remember that the second event (building a table) continued beyond the end of the first one. Grandpa commented on the fact that Father had not completed the job yet when he stopped sweeping, and the storyteller also emphasized that Father still had work to do. This was done to prevent the children from assuming that the second event finished once the first event ended. The experimenter also asked a clarification question at the end: *When Grandpa stopped sweeping, was the table ready?*

In the control condition (20b), the main clause was in the *imperfect*; the sentence suggested that the two events ran in parallel, while nothing was asserted about their respective ends. This matched the story, and acceptance of the test item was expected in the control condition.

Experiment 2 was more difficult for several reasons. The participants needed to remember two events and compute a relation of temporal inclusion between their temporal traces. In addition, they had to integrate semantic information related to the grammatical aspect and aktionsart of the sentences. However, the task is not beyond the capacity of 5-year-old children. Kazanina & Phillips (2007) showed that Russian-speaking children at the mean age of 4;10 performed well in a similar task. Moreover, according to Stoicescu (2018, 2019a), around the age of five, Romanian-speaking children are sensitive to the semantic contrast between the *perfect compus* and the *imperfect*.

There were two conditions: the test condition and the control condition, corresponding to the tense form in the main clause: *perfect compus* vs *imperfect*. Eight stories were told in total (four per condition). Three filler stories were also used.⁹ The target item was tested alongside two more filler sentences related to the story (which were either true or

false), so as to prevent the participants from forming response strategies. The test item list was randomized. The order of presentation of the test item and the filler sentences, as well as the truth values of the fillers and test items were randomized. In order to control for item effects, two variants of the test item list were administered, varying the *perfect/imperfect* in the test items, as well as the order for the presentation of the stories.

The second experiment did not control for pragmatic/semantic telicity. The telic predicates used to describe the perfective event were incremental theme predicates that referred to the creation of a physical object: *face un om de zăpadă* ‘make a snowman’, *croșeta un ciorap* ‘knit a sock’, *împleți o coroană* ‘weave a wreath’, *scrie o scrisoare* ‘write a letter’, *construi o masă* ‘build a table’, *prepara un tort* ‘cook a birthday cake’, *coace un cozonac* ‘bake a cake’, *pregăti un sandwich* ‘prepare a sandwich’. In Experiment 1, it was predicates like these (i.e. *make a cat* and *build x*) that elicited completion inferences from the earliest ages tested.

The children were introduced to a puppet, Grandma, and were told that she and the children would listen to a story illustrated with pictures, although she could not see very well. She would say what had happened in the story and the child would correct her. During the experiment, picture sets showing the various stages of the narrative were shown, illustrating four test stories and four control stories. The experiment was preceded by a practice session in which the children were trained to accept or reject sentences related to a story illustrated with pictures.

6.2.2. Participants

The participants were 25 Romanian-speaking typically-developing children (mean age 5;5, SD 5.2, age range 4;3-6;1). 12 of them were administered the first variant of the test item list, 13 of them were administered the second variant. All of them had participated in Experiment 1 as well. Six adult controls also participated.

6.2.3. Results

Table 4 presents the average percentages of congruent answers for the test and control items. A congruent answer means rejection in the *perfect compus* condition and acceptance in the *imperfect* condition.

	PERFECT COMPUS	IMPERFECT
5-year-olds	16	94
Adults	83	92

Table 4. Congruent responses (%).

For the scores on the *imperfect*, the assumptions of normality were not met (skewness was -2.201), therefore non-parametric tests were used throughout. The non-parametric independent samples Mann-Whitney U test was conducted to check for age differences. In the *perfect compus* condition, there was a significant difference between adults and children ($U(n_1 = 6, n_2 = 25) = 146.500, p < .001$). In the *imperfect* condition, there was no significant difference between adults and children ($U(n_1 = 6, n_2 = 25) = 75.500, p = .971$).

The non-parametric one-sample Wilcoxon signed-rank test was carried out to check whether the results differed from the chance level. For the *perfect compus*, the scores of both age groups were significantly different from the chance level (adults: $Z = 2.070, p = .038$; children: $Z = -4.109, p < .001$). The children's scores were significantly lower than the chance level, while the adults' scores were significantly higher than the chance level (as shown in Table 4). For the *imperfect*, the results of both age groups were significantly higher than the chance level (adults: $Z = 2.236, p = .025$; children: $Z = 4.613, p < .001$).

To sum up, adults overwhelmingly accepted the *imperfect* sentence, and rejected the *perfect compus*. Children accepted the *imperfect* sentence at the adult level. However, unlike adults, they mostly accepted the *perfect compus* test items. The semantic difficulty of the task, as well as the fact that the congruent answer presupposed rejection rather than acceptance, pushed down the results (more on this will be said in section 7).

6.2.4. Discussion

The second experiment investigated the research hypothesis that, in child Romanian, culmination is implied rather than entailed for certain incremental theme predicates such as predicates of creation. This hinged on the question whether children fail to make the culmination inference in a harder task than the one in Experiment 1, indicating that it is an implicature. The results confirmed the hypothesis. In Experiment 2, children mostly accepted incompleteness for the telic perfective past sentences (84%). This result stands in sharp contrast to Experiment 1, where the same 5-year-olds had much lower rates of non-culminating readings for similar predicates. The task of establishing inclusion between a perfective event and a reference interval provided by another event is still hard at age five.

The reading that the children gave was a process atelic reading. The clarification questions showed that the children had accepted the *perfect compus* sentence even if they were perfectly aware that the object had not been completed. When asked if the main clause character had finished the object when the other character stopped his activity, most of the children

said *no*, so they knew that the situation was incomplete. This means that they assumed that the *perfect compus* sentence held when the event merely progressed to some extent towards culmination. The children probably interpreted the test item as ‘while X was doing Z, Y worked at W’, as the *while*-clause referred to an interval of indefinite duration.

Corroborating the results for *build*-like predicates in the two experiments, we find that Romanian children consider the completion inference an implicature for this particular subclass; they are able to make it systematically from an early age in non-taxing tasks, but do not do so in contexts with increased semantic complexity.

6.3. Longitudinal data

6.3.1. Previous studies and research questions

Further insight into the use of telic predicates in child language can be gained by investigating longitudinal data. Input factors such as positional salience (Tardif *et al.* 1997), frequencies in child and child-directed speech, the diversity of the syntactic frames in which the verbs occur (Naigles & Hoff-Ginsberg 1998), a low degree of “word order variability” (Kieburg & Schulz 2010) have been shown to facilitate verb acquisition. At the same time, children are able to use syntactic cues in order to arrive at verbal meaning (Gleitman 1990).

Previous child corpus studies have shown that lexical aspect influences the production of grammatical aspect/tense inflectional morphology, as children correlate, for instance, past/perfective morphology to telic verb phrases (Antinucci & Miller 1975, Weist *et al.* 1984). No consensus has been reached as to how these correlations can be explained. One account (the Aspect First Hypothesis) claimed that lexical aspect serves as a springboard for the acquisition of tense (Bloom & Harner 1989, Antinucci & Miller 1975). Shirai & Andersen (1995) argued that children perform a statistical analysis of the adult input and attach inflections to prototypical aspectual classes.

Bertinetto *et al.* (2015) took issue with a presupposition inherent in the Aspect-First/Prototype Hypotheses, namely the notion that linguistic categories such as telic vs atelic are available to the child from the onset of acquisition. Analysing the longitudinal data of Italian children, the study showed that children used activity predicates more frequently with the perfective than expected for atelic predicates, in ways that reflected the adult input and did not conform to the above-mentioned accounts.

Kieburg & Schulz (2010), however, disputed the role of specific input factors in the acquisition of verbs. They showed that the token or

type frequencies of simplex verbs, particle verbs, and verbal particles in German CDS did not predict the actual order of acquisition of these elements in CS. This was confirmed by Sommer-Lolei *et al.* (2021), who showed that the precedence in the emergence of particles before that of prefixes is due to the much greater positional and prosodic salience of particles in both the target language and in CDS.

In this study, we carried out an analysis of Romanian longitudinal data in order to explore the production of telic predicates by both children and their adult caretakers at an earlier age than possible in experimental investigation. The research hypothesis for the longitudinal data study (see hypothesis (d) in section 5.3) was that there are some input factors that have an impact on the acquisition of telicity in child Romanian, and can explain some of the tendencies we see in the comprehension data. This runs against the more general claim related to the irrelevance of input frequency factors in Kieburg & Schulz (2010), and is more in line with the claim related to the input in Bertinetto *et al.* 2015. More specifically, we investigated whether the verbs tested in the experiments were used in telic or atelic contexts in CS and CDS, and whether any patterns were visible. Moreover, it was necessary to determine whether Romanian-speaking children have enough exposure to the relevant predicates at an early age to be able to acquire their semantics.

6.3.2. *The data*

The analysis was based on two corpora of child language: Bianca (1;5-2;11), recorded and transcribed by Larisa Avram (Avram 2001), and Iosif (1;10-3;1), recorded by Ioana Stoicescu (Stoicescu 2013). The first corpus can be found in the CHILDES database (MacWhinney 2000, <chil实现.psy.cmu.edu>). The recordings in Bianca's corpus lasted one hour and were made weekly (1;5.12-1;7.1, 1;9.21-1;10.29), and monthly (1;7.1-1;9.21, 1;11.26-2;11.22). 27 files from Bianca's corpus were analysed. The recordings belonging to Iosif were also monthly and covered the age span 1;10.23-3;1.13, with the exception of two weekly recordings at 2;2.4 and 2;2.13. They lasted either half an hour or an hour. Iosif's corpus also included sporadic speech by his 4-year-old brother, Aron, which was also analysed (at ages 4;6.5, 4;8.5, 4;9.26, 4;10.25, 5;0.25, 5;1.25, 5;3.27, 5;4.23).

As concerns CDS, it mainly included the speech of the children's mothers, as well as some sporadic speech by other adult caretakers (the father or grandmother). The latter did not feature frequently in the recordings, and the relevant number of predicates was quite small for them, so we decided to collapse their data with the data of the main caretaker. The details about the two corpora are summarized in Table 5 below.

CHILD	AGE RANGE	RECORDING SESSIONS	NUMBER OF CDS PREDICATES ANALYSED	NUMBER OF CS PREDICATES ANALYSED
Bianca	1;5.12-2;11.22	27	970	234
Iosif	1;10.23-3;1.13	18	272	211
Aron	4;6.5-5;4.23	7	–	106

Table 5. The longitudinal corpora.

6.3.3. Methodology

We identified the finite predications built with the verbs used in the experiments described above, classified them as telic and atelic, and counted them. We looked for verb phrases built with both (i) semantically/pragmatically telic incremental theme and (ii) change of state verbs. We found predicates based on (i) *construi* ‘build’, *face* ‘make/do’, *scrie* ‘write’, *pregăti* ‘prepare’, *mânca* ‘eat’, *bea* ‘drink’, *desena* ‘draw’, (ii) *închide* ‘close’, *deschide* ‘open’, *stinge* ‘extinguish’, *găsi* ‘find’.

One should note that Romanian does not distinguish between *make* and *do* – the same verb *face* expresses both meanings, which are dependent on the interaction with the direct object (*face tema* ‘do the homework’, *face patul* ‘make the bed’). In addition, *face* is used as a light verb in a variety of expressions that can be both atelic and telic (*face nani* ‘take a nap’). The verb *face* thus occurred in both telic incremental theme verb phrases (*face un castel* ‘make a castle’), as well as telic and atelic non-incremental predications (*face schimb* ‘exchange’, *face vânt* ‘fan’), but we took into account all cases, in order to assess the frequency of telic or atelic uses of this verb in CS and CDS.

The lexical aspect of the predicates [\pm telic] was determined using the telicity tests described in section 3, applied to the nonfinite infinitival form of the verb phrase, as well as pragmatic cues present in the immediate context. We focused on the aspectual features of the nonfinite VPs because the focus of the analysis was not on the interaction between higher tense/grammatical aspect operators and lexical aspect, rather the distribution of verbs in telic vs atelic syntactic contexts, i.e. (a)telicity at the level of the VP. According to MacDonald (2008), lexical aspect is computed in an AspP within the vP. Consequently, we carried out a global count of the finite predicates taking into account only their telicity feature, without distinguishing between tense-aspect forms and moods. For the same reason, if the inflectional marking (e.g. the present or the *imperfect* referring to an ongoing event) had a detelicizing effect on a telic predicate, we took into account the aktionsart of the nonfinite predicate. In addition, we also counted the frequencies of telic/atelic VPs in the past tense, where

this opposition is assumed to be most salient. Some infrequent predicates were ambiguous between telic and atelic interpretations (e.g. *face baie/duș* ‘have a bath/shower’), and were removed from the count. We also left out repetitions, poems, formulaic speech, as well as unclear utterances and unintelligible sentence fragments.

6.3.4. Results: child speech

The results of the quantitative analysis of the child speech are presented in Tables 6-7, which list the verbs actually produced by children in the first column, and the percentages and raw numbers of telic vs atelic predications formed with them in the following columns. In CS, the most frequent forms were the indicative present and the *perfect compus*, as well as the subjunctive. The general trend was for incremental theme verbs to occur in atelic contexts. Bianca produced predicates formed with *face* ‘do/make’, *mânca* ‘eat’, *bea* ‘drink’, *scrie* ‘write’, *desena* ‘draw’, *pregăti* ‘prepare’ (Table 6). The majority of the predicates were atelic (57-100%). Iosif produced verb phrases based on *face* ‘do/make’, *mânca* ‘eat’, *bea* ‘drink’, *pregăti* ‘prepare’, most of which were atelic as well (55-100%). Iosif’s older brother produced only *face* ‘do/make’, *mânca* ‘eat’, *bea* ‘drink’, *construi* ‘build’. These verbs appeared more frequently in atelic predications, with the exception of *construi* ‘build’, which only occurred in telic contexts.

There were no predicates formed with the verbs *croșeta* ‘knit’, *împleți* ‘weave’, *prepara* ‘cook’, *coace* ‘bake’ *curăța* ‘peel’, *picta* ‘paint’, *goli* ‘empty’. These verbs do not occur in CDS either (see section 6.3.5).

Verbs	BIANCA		IOSIF		ARON	
	Telic	Atelic	Telic	Atelic	Telic	Atelic
<i>Face</i> ‘do/make’	43 (N=52)	57 (N=69)	45 (N=37)	55 (N=45)	42 (N=33)	58 (N=45)
<i>Mânca</i> ‘eat’	32 (N=15)	68 (N=32)	37 (N=27)	63 (N=46)	47 (N=7)	53 (N=8)
<i>Bea</i> ‘drink’	17 (N=2)	83 (N=10)	14 (N=2)	86 (N=12)	–	–
<i>Scrie</i> ‘write’	14 (N=3)	86 (N=18)	–	–	–	–
<i>Pregăti</i> ‘prepare’	–	–	0	100 (N=2)	–	–
<i>Construi</i> ‘build’	–	–	–	–	100 (N=2)	0
<i>Desena</i> ‘draw’	0	100 (N=1)	–	–	–	–

Table 6. Percentages and raw numbers of telic vs atelic uses of STIT and PTTT predicates in CS.

The children used *mânca* ‘eat’ and *bea* ‘drink’ in atelic contexts, both intransitively (21a) or transitively, with mass nouns (21b-c), or bare plural direct objects (21d). The high number of atelic predicates was due to the nature of the dialogues between children and their parents and siblings at young ages. The focus was on whether eating and drinking in general occurred at all, and the kind of stuff children or animals habitually eat or drink. This made the use of mass noun or bare plural objects more likely.

- (21) a. *Fata (măn)âncă.* Bianca 1;10.01
 girl_the eats
 ‘The girl is eating.’
- b. *Mănânci carne d-elefant?* Aron 5;5.26
 eat.PRS.2SG meat of-elephant
 ‘Do you eat elephant meat?’
- c. *Și Bianca nu bea be(r)e, tata bea be(r)e.* Bianca 2;2.13
 and Bianca not drinks beer Dad drinks beer
 ‘And Bianca does not drink beer, Dad drinks beer.’
- d. *Nu, că bețe mănâncă.* Bianca 2;1.18
 no that sticks eats
 ‘No, because it is sticks that it eats.’

Telic contexts were less frequent with these verbs; children engaged less often in dialogues about episodes of eating or drinking specific items and used quantized object DPs less frequently. Some examples of telic predicates produced by children are provided in (22). The direct object is a clitic pronominal in (22a), a universal quantifier in (22b), and a definite DP in (22c).

- (22) a. *Și-o să-l mănânc în pat.* Bianca 2;11.22
 and-will SBJV-CL.ACC.3SG.M eat.SBJV.1SG in bed
 ‘And I will eat it in bed.’
- b. *Eu am mâncat tot.* Iosif 2;4.10
 I have eaten everything
 ‘I ate everything.’
- c. *Mănâncă mărul otrăvit.* Aron 5;5.26
 eats apple_the poisoned
 ‘She is eating the poisoned apple.’

The children also constructed atelic verb phrases based on *pregătesc* (23a) (with a mass noun object), and *write* (23b) (used intransitively).

- (23) a. *P(r)egătesc mâncare, ce crezi că* Iosif 3;0.15
 prepare.PRS.1SG food what think.PRS.2SG that
pregătesc?
 prepare.PRS.1SG
 ‘I am preparing food; what do you think I am preparing?’

- b. *Scriu pe asta.* Bianca 2;7.20
 write.PRS.1SG on this
 ‘I’ll write on this.’

In CS, the verb *face* ‘do/make’ was mostly used in atelic contexts that did not refer to incremental processes. This was due to the large number of *wh*-questions (*ce faci?* ‘what are you doing?’), light verb expressions (e.g. *face cu mâna* ‘wave’) (24a), and intransitive predications (24b).

- (24) a. *Face (cu) mâna.* Bianca 1;10.29
 do.PRS.3SG (with) hand_the
 ‘It is waving.’
 b. *Așa a făcut (Mickey Mouse).* Bianca 2;7.20
 so has done (Mickey Mouse)
 ‘This is what it did.’

One found telic uses of the verb *face* ‘make/do’ in either incremental theme predicates (25a), light verb expressions (25b), or predications referring to gradual development (25c). Aron also produced *construi* ‘build’ telic predications in the context of a car building event (25d).

- (25) a. *Gata, ți-am făcut un bebeluș.* Bianca 2;4.11
 ready CL.DAT.2SG-have made a baby
 ‘Here, I have made you a baby.’
 b. *Facem schimb.* Aron 4;9.26
 make.PRS.1PL exchange
 ‘Let’s make an exchange.’
 c. *Dup-aia a făcut burta mai mare, mai Iosif 2;8.13
 after-that has made belly_the more big more
 mar(e), mai mare.
 big more big
 ‘Then the belly got bigger and bigger and bigger.’*
 d. *Încerc să vă construiesc ceva.* Aron 4;8.5
 try.PRS.1SG SBJV. CL.DAT.2PL build.SBJV.1SG something
 ‘I am trying to build you something.’

Among change of state verbs, the children produced *găsi* ‘find’, *închide* ‘close’, and *deschide* ‘open’. These verbs emerged after the incremental theme verbs discussed above (*închide* ‘close’ at 2;4.11 for Bianca, and 2;8.13 for Iosif, *găsi* ‘find’ at 2;5.18 for Bianca, and 2;5.12 for Iosif, *deschide* ‘open’ at 2;5.18 for Bianca, and 2;7.20 for Iosif).

As can be seen in Table 7, as expected, change of state predicates were all produced in telic contexts (26).

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Verbs	BIANCA		IOSIF		ARON	
	Telic	Atelic	Telic	Atelic	Telic	Atelic
<i>Găsi</i> 'find'	100 (N=17)	0	100 (N=9)	0	100 (N=3)	0
<i>Închide</i> 'close'	100 (N=9)	0	100 (N=12)	0	100 (N=4)	0
<i>Deschide</i> 'open'	100 (N=6)	0	100 (N=19)	0	100 (N=4)	0

Table 7. Percentages and raw numbers for telic vs atelic uses of change of state predicates in CS.

(26) *I-am găsit.* Bianca 2;5.18
 CL.ACC.3PL.M-have.1SG found
 'I have found them.'

Comparing the data of the older boy and the younger children, the global pattern is preserved – in all CS, incremental theme verbs tended to occur in atelic verb phrases, while change of state predicates were telic.

Since the telic/atelic opposition is most salient in the past tense, we also report the frequencies of telic/atelic incremental theme predicates in the *perfect compus*. The results are provided in Table 8. In Bianca's speech, the atelic predications were more frequent for *face* 'do/make', *mânca* 'eat', *bea* 'drink', and *scrie* 'write'. The pattern was reversed in Iosif's speech for these verbs. Most of his *perfect compus* predicates were telic. For the verbs *face* 'make', and *construi* 'build', this was due to the fact that Iosif and his brother talked a lot about what they had made, either dishes or objects (27), and used more telic *face* predicates in the past.

Verbs	BIANCA		IOSIF		ARON	
	Telic	Atelic	Telic	Atelic	Telic	Atelic
<i>Face</i> 'do/make'	43 (N=12)	57 (N=16)	75 (N=21)	25 (N=7)	73 (N=22)	27 (N=8)
<i>Mânca</i> 'eat'	38 (N=5)	62 (N=8)	56 (N=14)	44 (N=11)	20 (N=1)	80 (N=4)
<i>Bea</i> 'drink'	17 (N=1)	83 (N=5)	100 (N=1)	0	–	–
<i>Scrie</i> 'write'	29 (N=2)	71 (N=5)	–	–	–	–
<i>Construi</i> 'build'	–	–	–	–	100 (N=1)	0
<i>Găsi</i> 'find'	100 (N=10)	0	100 (N=3)	0	100 (N=3)	0
<i>Închide</i> 'close'	100 (N=5)	0	100 (N=3)	0	–	–
<i>Deschide</i> 'open'	100 (N=1)	0	100 (N=1)	0	–	–

Table 8. Percentages and raw numbers of telic vs atelic uses of investigated verbs in the *perfect compus* in CS.

- (27) *Am făcut o săgeată.* Iosif 2;11.22
have.1SG made an arrow
'I have made an arrow.'

Iosif's higher rate of past telic *mânca* 'eat' predicates was due to two recordings: in one file, he repeatedly stated that he ate everything (22b), and, in another, he played a mealtime game, pretending to eat various types of food and then naming the specific dishes he had eaten. This type of discourse resulted in a higher number of telic predicates. Verb phrases formed with *mânca* 'eat' were mostly atelic in Aron's speech, as they were in Bianca's corpus.

6.3.5. Results: child-directed speech

The child-directed speech was analysed using the same criteria as child speech. The findings of the global analysis are given in Tables 9-10. The trend is similar to child speech: incremental theme verbs generally occurred in atelic constructions, while change of state verbs always appeared in telic contexts. The most frequent finite forms in CDS were the indicative *prezent*, and *perfect compus*, as well as the subjunctive, and imperative. In Bianca's CDS, one found verb phrases based on *face* 'do/make', *mânca* 'eat', *bea* 'drink', *scrie* 'write', *desena* 'draw', most of which were atelic – see Table 9. In Iosif's CDS, the rates for *do/make*, *eat*, *write* atelic predications were high (77-100%). In Iosif's CDS, *drink* predicates were generally telic (75%) due to the repetition of one predicate (*drink a little water*) by Iosif's mother at 2;8.13. *Build* predicates were all telic in Bianca's CDS. Iosif's caretakers did not produce the verbs *construi* 'build', and *desena* 'draw'.

The relevant syntactic contexts were similar in CDS and CS. In CDS, the verb *mânca* 'eat' was generally found in atelic predications; it was used intransitively or with mass/bare noun and bare plural objects.

In Bianca's CDS, as in CS, the predicates based on *scrie* 'write' were atelic, as they referred to the process of writing, not the finished product – the focus was on what the child should write with, on what surface, the right posture for writing, etc. In Iosif's CDS, *write* predicates had atelic interpretations, but the children did not produce any *write* VPs. The verb *desena* 'draw' was mostly used intransitively in CDS, but *draw* predicates were not produced by the children.

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Verb	CDS (BIANCA)		CDS (IOSIF)	
	Telic	Atelic	Telic	Atelic
<i>Face</i> 'do/make'	23 (N=135)	77 (N=448)	23 (N=39)	77 (N=132)
<i>Mânca</i> 'eat'	33 (N=86)	67 (N=175)	23 (N=16)	77 (N=53)
<i>Bea</i> 'drink'	23 (N=11)	77 (N=36)	75 (N=3)	25 (N=1)
<i>Construi</i> 'build'	75 (N=3)	25 (N=1)	–	–
<i>Scrie</i> 'write'	0	100 (N=18)	0	100 (N=4)
<i>Desena</i> 'draw'	0	100 (N=2)	–	–

Table 9. Percentages and raw numbers for telic vs atelic uses of incremental theme verbs in CDS.

Atelic light verb expressions based on *face* 'do' were frequent in all the children's CDS (*a face nani* 'do sleep'). *Face* 'do/make' was also used in *wh*-questions. Telic 'make an object' contexts were less frequent; for instance, in Bianca's CDS, at 2;8.19, out of the 12 *face* 'make/do' predications produced by the adult caretakers, only 4 referred to building something. Change of state verbs occurred in telic predications in the CDS of both children, as can be seen in Table 10.

Verb	CDS (BIANCA)		CDS (IOSIF)	
	Telic	Atelic	Telic	Atelic
<i>Găsi</i> 'find'	100 (N=20)	0	100 (N=18)	0
<i>Închide</i> 'close'	100 (N=23)	0	100 (N=5)	0
<i>Deschide</i> 'open'	100 (N=11)	0	100 (N=1)	0
<i>Stinge</i> 'extinguish'	100 (N=1)	0	–	–

Table 10. Percentages and raw numbers for telic vs atelic uses of change of state predicates in CDS.

Table 11 provides the results of the analysis of the *perfect compus* predications in CDS. In Bianca's CDS, there was a predominance of atelic contexts for *face* 'do/make', *mânca* 'eat', and *bea* 'drink'. Iosif's CDS contained a slightly higher rate of telic *face* 'do/make' predicates (59%), but *eat* predicates were mostly atelic (79%).

Verbs	CDS (BIANCA)		CDS (IOSIF)	
	Telic	Atelic	Telic	Atelic
<i>Face</i> 'do/make'	45 (N=37)	55 (N=46)	59 (N=17)	41 (N=12)
<i>Mânca</i> 'eat'	30 (N=23)	70 (N=54)	21 (N=3)	79 (N=11)
<i>Bea</i> 'drink'	0	100 (N=8)	–	–
<i>Desena</i> 'draw'	0	100 (N=2)	–	–
<i>Găsi</i> 'find'	100 (N=6)	0	100 (N=10)	–
<i>Închide</i> 'close'	100 (N=9)	0	–	–

Table 11. Percentages and raw numbers for telic vs atelic uses in the *perfect compus* in CDS.

6.3.6. Discussion

Summing up, the analysis of the longitudinal corpora revealed the following main trends, which we are able to formulate for the most frequently produced verbs. PTIT verb phrases based on *eat*, *drink*, *write*, *draw* were generally atelic in CDS/CS. As for *face* 'make/do' predicates, the children were exposed to and produced a high variety of syntactic constructions (e.g. *wh*-questions, light verb expressions), among which the atelic uses were more frequent than the telic incremental theme ones. Change of state verbs occurred only in telic contexts both in CS and CDS.

The analysis of the longitudinal corpora confirmed the hypothesis that input factors are relevant for the acquisition of telicity. We found that the pattern of use for the incremental theme predicates investigated was similar in CS and CDS. Children were more exposed to atelic contexts for such verb phrases and this pattern was replicated in their output. The high exposure to atelic contexts for incremental theme verbs can be correlated with the patterns seen in the comprehension experiments. At early ages, Romanian-speaking children are more frequently exposed to sentences where verbs like *eat* or *drink* have atelic interpretations. It is likely that this overexposure to atelicity makes the process stage of such eventualities highly salient for children, and the telic interpretation more difficult to access. This accounts for the high rate of atelic interpretations assigned to predicates formed with these verbs in experiments.

7. General discussion

The research hypotheses presented in section 5.3 were confirmed. In child Romanian, sensitivity to telicity develops gradually and reflects the variability of the predicates found on the telicity spectrum. In the first experiment, around the age of three, children demonstrated sensi-

tivity to the telicity of predicates with simple unambiguous semantics, such as change of state predicates, as well as some prototypical object creation predicates, such as *make* and *build* VPs. The acquisition of telicity for other incremental theme predicates progressed more slowly than for STCS verbs. PTIT predicates had a different acquisition path from STIT predicates. There was no development in the comprehension of PTIT predicates by age 5, while performance relative to STIT predicates either progressed by age 5 (for *empty*) or was good from the earliest age tested (for *make a cat* and *build x*). Children assigned both telic and atelic readings to PTIT predicates, and treated them more flexibly than adults. By age five, the Romanian children tested had not acquired the pragmatic competence that made adults draw the completion implicature for PTIT predicates.

The investigation of the longitudinal corpora suggested that young children are overexposed to atelic contexts for incremental theme verbs, which makes the telic interpretation likely to develop more slowly. Overall, the study confirms the idea put forth in Bertinetto *et al.* 2015 that children learn about the telicity of various incremental theme predicates gradually, starting with predicates that describe prototypical culminating situations. The speed of acquisition is influenced by the semantics of the predicates, and the child's experience with the relevant verbs and his linguistic environment. This runs contra the claim that frequency properties of the input do not play a major part in verb acquisition (Kieburg & Schulz 2010: 106). This study showed that verbs that have pragmatic telicity are frequently used in sentences with atelic interpretations both in CS and CDS.

The experiments allowed us to probe the nature of the completion inference for the STIT class. The first experiment showed that children did assign telic readings to some STIT verbs (early for *make* and *build*; at age 5 for *empty*), but, in the second experiment, it became apparent that the culmination inference was not compulsory with *make* and *build*, and similar physical object creation verbs. This suggests that it is a cancelable implicature. Children draw it from an early age in sentences with simple semantics, but do not access it when processing a semantically challenging sequence of sentences. Even if culmination is entailed in the adult language for the STIT class, it is not automatic inference for children. Thus, our results are in line with Anderson (2017), who argued for a non-adult-like representation of STIT verb phrases, similar to that of PTIT verbs. However, our study qualifies Anderson's claims by showing that, for predicates of creation of physical objects, Romanian-speaking children were able to draw the completion implicature from the age of 3;4.

The study disconfirmed the scenario put forth by Martin *et al.* (2020) in which incremental theme predicates are problematic for children because of their supposed inability to assign maximal readings to quantized DP objects. This would have predicted uniform treatment of all incremental theme predicates, but we did find differences between STIT and PTIT predicates, as well as within the STIT class itself. In the first experiment, *make a puzzle* was treated differently from *make a car*, despite the fact that the direct object was quantized in both cases.

The first experiment also showed that the direct object DP that is associated with an incremental theme verb is very important. *Make a cat* was associated with lower rates of non-culminating interpretations than *make a puzzle*, which was regarded as ambiguous, and triggered many process readings. The analysis of CDS showed that children are exposed to high rates of atelic *face* ‘make/do’ verb phrases in a large variety of syntactic contexts. It is possible that, for some *face* predicates like *face un puzzle* ‘make a puzzle’, children initially build non-adult-like representations in which the process stage is more salient than it is for adults. Another interesting fact is that the verbs *peel* and *empty*, which were more problematic than *build* and *make (a cat)* at the early ages in the experiments, were not found in CDS in the longitudinal corpora; children probably have little exposure to them, and thus fewer opportunities to figure out their semantics. This shows the importance of the accumulation of linguistic experience for the acquisition of telicity.

While the paper cannot focus on crosslinguistic comparison due to methodological differences from previous studies, it does provide some pointers to be taken up in future work of this kind. For instance, Martin *et al.* (2017, 2020), based on the findings in Van Hout *et al.* (*forthcoming*), suggested that the indeterminacy of past tense forms that have both perfective and imperfective readings are conducive to higher rates of non-culminating interpretations across predicate groups, change of state predicates included. Our study did not find high rates of non-culminating interpretations for change of state predicates; they were under 15%. The high non-culminating readings rates for change of state predicates found in child English (Martin *et al.* 2017 reporting on Van Hout *et al.* *forthcoming*) might be due to another factor, namely the presence of a *while*-clause in the test sentence. Wright (2014) argued that *while*-clauses relax telicity in adult English. Indeed, our second experiment proved that *while*-subordinates led to an overgeneration of non-culminating interpretations even in child Romanian. In experiments where the test sentence is a simple clause, non-culminating interpretations are very infrequent for change of state verbs (Van Hout *et al.* 2017).

Moreover, Martin *et al.* (2017, 2020) hypothesized that young English speakers overgeneralize the imperfective interpretation allowed by past forms in stative and generic/habitual contexts to telic predicates. Thus, telic eventuality descriptions come to be accepted in situations where atelic descriptions would have been more appropriate. It was claimed that this accounts for English-speaking children's non-culminating readings of past telic sentences. However, children's overgeneralization of state/generic/habitual imperfective meanings to telic predications would presuppose some knowledge that past stative or past generic/habitual sentences have imperfective readings. This is still something that needs to be investigated for child English and similar languages. Overgeneralization would also mean that English-speaking children do not distinguish between states and telic predicates. However, that is unlikely, since children very rarely overgeneralize the progressive to states (Shirai & Andersen 1995).¹⁰

The results of this study for incremental theme predicates are similar to those reported in Garcia del Real (2015) for child Spanish at the age of five – in Romanian, the percentage of non-culminating interpretations for incremental theme predicate was 34% at the age of 5, in child Spanish, the percentage was 25/30% (for the perfect and the past simple, respectively). This suggests that, even if Romance perfect forms allow both perfective and imperfective perfectal readings, this does not encourage acceptance of non-culmination by children. The imperfective meaning for Romance perfects is obtained only in restricted syntactic contexts. These uses are infrequent in child corpora – in the longitudinal data we analysed, the adults produced universal perfect sentences less than five times. It is unlikely that the children have enough exposure to this use of the perfect to be able to generalize it to telic predicates.

This study lends support to the criticism in Bertinetto *et al.* (2015) levelled at the Aspect First Hypothesis, a theoretical stance that assumes early knowledge of the linguistic category of telicity, which guides the production of tense-aspect forms. This piece of research showed that Romanian children's competence related to the comprehension of telicity in the target language is subject to development. Further research should establish how these findings can be reconciled with accounts of the correlations between perfectivity and telicity found in the production data.

8. Conclusions

The study explored the Romanian children's comprehension of the telicity of three predicate types: semantically telic incremental theme,

pragmatically telic incremental theme and change of state VPs. The results showed that the sensitivity to the telicity of change of state predicates was present early, from the age of three. The study also found that Romanian-speaking children do not acquire all incremental theme predicates in a uniform way. For semantically telic incremental theme predicates, the overall scores gradually converged towards the adult level as the proportion of non-culminating interpretations decreased with age. Moreover, within this class, *build* and *make* predicates were associated with event culmination from the age of three, like change of state predicates. However, in the second experiment, the children did not make the relevant completion inference in semantically complex contexts for *build*, *make*, and similar verbs, which suggested that it was an implicature.

By contrast, pragmatically telic incremental theme predicates were not systematically associated to completion by any of the child groups tested, allowing both telic and atelic interpretations until the age of five. These predicates were assigned atelic interpretations at a higher rate than in the adult language, regardless of age. The analysis of the longitudinal data pointed to a predominance of atelic uses of the verbs from this class in both CDS and CS.

Further research should address the variability of the incremental theme class in other child languages. In child Italian and other Romance languages, given the absence of overt telicity markers, there might occur varying rates of non-culminating readings. In Slavic languages, given the presence of overt perfectivity/telicity markers, one might find early knowledge of telicity for both incremental theme and change of state predicates.

Abbreviations

CS = child speech

CDS = child-directed speech

PTIT = pragmatically telic incremental theme predicates

STCS = semantically telic change of state predicates

STIT = semantically telic incremental theme predicates

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Notes

¹ With certain direct object DPs, *open* can be associated with a pragmatic range of validity, which can be harder to obtain with *close* (compare *I opened the door but only a little* with *I closed the door but only a little*). Nothing in the paper hinges on this.

² Atelic predicates can be felicitous with *in x time*, *take x time* only with the marginal reading that the event started after the relevant interval had elapsed.

³ The example may be marginally acceptable under unusual pragmatic conditions.

⁴ One reviewer asked if a continuation such as *Încă mai plânge* 'He is still crying' is possible for activity predicates. It is possible, but only due to the fact that the adverb *încă* 'still' and the clitic adverb *mai* 'more' induce a reading in which the continuation refers to the same event. Without these constituents, the present tense continuation is problematic.

⁵ One reviewer asked us to clarify how the predicate *make a cat* was illustrated. The cat was assembled from several body part pieces.

⁶ One reviewer was concerned about the use of a measure phrase for the verb *drink* instead of an ordinary indefinite DP. This is indeed a limitation but it accommodated the fact that, in Romanian, *drink* is normally used with indefinite objects if they designate liquids that are not highly familiar to very young children (*drink a coffee*, *drink a tea*). That is why we chose more familiar liquids (*water*, *juice*), and we used an indefinite measure phrase as a direct object. In his experiment with English-speaking adults, Wright (2014) also used a measure phrase with *drink* (*drink a cup of coffee*) and got a very high rate of non-culminating interpretations. This means that the use of a measure phrase does not necessarily induce a stronger suggestion of event culmination than an indefinite DP.

⁷ According to Rappaport Hovav (2008), the verbs *eat* and *build* are incremental, and associated with extent/volume scales through the direct object. The verb *empty* is scalar itself, and related to a closed property scale (Kearns 2007); it is linked to a maximal value and thus culmination is its default interpretation (Filip 2014). The verb *curăța* is deadjectival (the Romanian adjective is *curat* 'clean'), but the meaning tested here is 'to remove peel', not 'to make cleaner', so not related to the adjective. It is not scalar in itself; the scale is assigned through the object.

⁸ The 'yes' bias is a limitation of experimental work, and that is why it was very important to investigate spontaneous data as well, where the bias does not operate (see section 6.3).

⁹ The filler stories had a simpler construction. They started with a description of a character's intention, followed by a succession of events (in the present simple) (*Andreea vrea sa gătească o ciorbă. Cumpără legume de la piață. Taie legumele. Mestecă în ciorbă. Când e gata, o pune în farfurie* 'Andreea wants to cook a soup. She buys vegetables from the market. She cuts the vegetables. She mixes the soup. When it is ready, she puts it in the plate'). Children evaluated three sentences that checked their understanding of the filler story (e.g. *Andreea a cumpărat carne de la piață* 'Andreea bought meat from the market' – false).

¹⁰ There is evidence that children possess an early minimal understanding of imperfectivity. Dressler *et al.* (2019) pointed out that, as early as 1;2, Russian children use root reduplication to express iterativity or ongoingness. Gagarina (2000) showed that, in early child Russian, reduplication of an onomatopoeia refers to ongoing events (see also Gagarina 2003, for child Russian, and Gülzow 2003, for the progressive in child English).

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