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Insights from the Meaning First Approach and cognition into denominal verbs in child language: *Cherrying* means 'eating cherries', not 'becoming like a cherry'

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We experimentally investigate the meaning of denominal verbs in child and adult Romanian using a semi-artificial/semi-nonce denominal verb (SAD) paradigm, i.e., using non-existent verbs derived from familiar nouns (*a cireși* 'to cherry'). Importantly, the SAD paradigm allows us to probe into meaning formation without the lexical bias of existing verbs. To see whether children have difficulties understanding SAD verbs in linguistic contexts, we conducted a **Contextual Denominal Task**. Children were asked to select a matching picture after hearing sentences with SAD verbs in linguistic contexts biasing them for a particular interpretation. Children generally opted for a literal interpretation of *a cireși* 'to cherry', involving the actual object *cherry* ('to pick/eat cherries'), over a figurative interpretation such as *a deveni (roșie) ca cireașa* 'to become (red) like a cherry', i.e., 'to blush' even in figurative-biasing contexts (like *Mary cherried when John told her she was beautiful*). In order to see whether children perform better when the meaning is made explicit or whether they have a general difficulty with figurative meanings (whether implicit or explicit), we also conducted an **Explicit Denominal Paraphrase Task**, where children were instead exposed to the corresponding denominal paraphrases (e.g., *a deveni ca cireașa* 'to become like a cherry'). Children performed almost adult-like when the figurative meaning was more explicit. We account for our findings within a Meaning First Approach (Sauerland & Alexiadou 2020; Guasti, Alexiadou & Sauerland 2023), which assumes that compressed meaning is hard, and that decompressing words is subject to two possible principles: (structural and conceptual) simplicity and plausibility. While adults tend to observe plausibility, children prefer simplicity more, generally opting for literal readings, which merge the light verb DO or similar verbs with nouns (Hale & Keyser 2002; Kiparsky 1997).

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1 Aim

Denominal verbs allow for two kinds of interpretations: literal interpretations, which involve the actual entity denoted by the nominal root the verb is derived from (such as ‘to cover something with butter’ for *to butter*), or figurative interpretations, which involve becoming or behaving like the entity denoted by the nominal root (such as ‘to act like a monkey’ for *to monkey (around)*). Such discussions go back to Clark & Clark (1979), Aronoff (1980), Kiparsky (1997), and Harley & Haugen (2007) (among others) and bring to the forefront important questions about how we understand meaning formation below the word level. How are these interpretations derived? And why are certain interpretations preferred over others?

Given the many lexical idiosyncrasies which characterize denominals in natural languages (e.g., the meaning of *to book* does not immediately relate to the noun *book*), we might get a better understanding of the formation of the meaning of denominals if, instead of looking at familiar verbs, we investigated semi-artificial denominal (SAD) verbs created from familiar nouns, such as *a cireși* ‘to cherry’ or *a vulpi* ‘to fox’ in Romanian, the language we focus on here. Such a paradigm would enable us to probe how children and adults form meaning below the word level by removing the lexical bias inherent in familiar denominals. Thus, we could see what kind of structural rules and pragmatic constraints children and adults rely on.

Starting from the idea that a SAD paradigm offers us an advantage over familiar verb-noun pairs, we experimentally investigate how Romanian 5-year-olds and adults understand such verbs in various linguistic contexts. Importantly, in our paradigm, the same SAD verb can have both literal interpretation, which involve the actual entity denoted by the root, and figurative ‘become like N’/‘behave like N’ interpretations (see (1) for a non-exhaustive list of actual examples provided by participants in one of our tasks):

- (1) a. *a cireși* ‘to cherry’
 Literal interpretations = ‘to eat cherries’, ‘to pick cherries’
 Figurative interpretations = ‘to blush’, ‘to turn red in the face’ (‘to become like a cherry’)
- b. *a vulpi* ‘to fox’
 Literal interpretations = ‘to catch foxes’, ‘to turn into a big fox’
 Figurative interpretations = ‘to lie’, ‘to trick’ (‘to act like a fox’)

Some of these interpretations are more plausible than others or even exist in other languages (e.g., the English verb *to fox* expresses the meaning ‘to puzzle’, and *to outfox* expresses the meaning ‘to defeat someone by being more cunning than them’). The indeterminacy of SAD verbs is extremely important, as it allows us to determine what interpretations children and adults prefer. However, it might be that these preferences differ when meaning is made more explicit through paraphrases. Thus, we conducted two experiments: a **Contextual Denominal Task** and an **Explicit Denominal Paraphrase Task**, both picture selection tasks, where participants heard

a sentence with a SAD verb/a corresponding denominal paraphrase in a linguistic context biasing them for a literal or a figurative interpretation (see 2a, b):

- (2) a. *Maria a cireșit când Ion i-a zis că e frumoasă.* (figurative bias)
 Maria has cherried when John CL-has told that is beautiful
 ‘Mary cherried when John told her she is beautiful.’
- b. *Maria a devenit ca cireșa când Ion i-a zis că e frumoasă.* (figurative bias)
 Maria has become like cherry-the when John CL-has told that
 is beautiful
 ‘Mary became like a cherry when John told her she is beautiful.’

Previewing the results, we found that children perform more adult-like with denominal paraphrases than with denominal verbs, which they tend to interpret literally regardless of context. Our experiments shed light on the lexical syntax of denominals from an acquisition perspective, providing important insights into how meaning is formed below the word level, as well as into the important role played by the context and the explicitness of language.

Our paper is structured as follows: after presenting the aim of the paper, in Section 2, we present some general background on denominal verbs. In Section 3, we present a previous experiment eliciting sentences and paraphrases with SAD verbs from Romanian children and adults, as well as the two current experiments on SAD verbs (the Denominal Task and the Explicit Denominal Paraphrase Task). In Section 4, we draw conclusions based on our experimental research.

2 Background on denominal verbs

2.1 Theoretical approaches to denominal verbs

Denominal verbs, i.e., verbs derived from nominal roots/nouns, have received a lot of attention in both morpho- and cognitive-semantic research, as well as in morphosyntactic research on word formation (see Grestenberger & Kastner 2022 for an overview).

From a morpho-semantic perspective (Aronoff 1980; Plag 1999; Lieber 1992; 2004), zero-derivation/conversion (of a noun into a verb) has been analyzed as a semantically impoverished morphological process of the form $X_N \rightarrow X_V$, where the verb denotes an activity/a state/a process which must have some connection with the noun. Thus, given this loose connection, conversion is a highly unpredictable and polysemous word-formation process: the zero affix is able to express a wide variety of meanings, from activities which involve the actual entities denoted by the noun to activities which involve similarities to the appearance or behaviour of such entities. For instance, the denominal *to eel* can mean either ‘to fish for eel’ or ‘to move like an eel’, and the denominal *to crew* can mean either ‘to assign to a crew’ or ‘to act as a member of a crew’ (Plag 1999).

An important notion that has been discussed in relation to the similative ('behave like N') interpretation of behaviour-related verbs has been the notion of *stereotype*, of prototypical features which characterize a certain behaviour. Aronoff (1980) argues that the convention which makes possible novel denominal verbs with 'act like' meanings is the same as the convention which determines the possible domains of evaluation. For instance, (3) follows from a paraphrase such as *My sister, who is a good Houdini, got out of the locked closet*.

(3) *My sister **Houdini'd** her way out of the locked closet.* (Clark & Clark 1979: 784)

Similarly to judging someone to be a good Houdini, judging someone to Houdini requires familiarity with Houdini (a famous escape artist and illusionist) and his typical/characteristic activities/behaviour. Building on previous insights into the figurative, prototypical, 'kind' interpretation of indefinite nouns in general (von Heusinger & Wespel 2007; de Swart et al. 2007) and on the semantics of denominals derived with the suffix *-ize* (Plag 1999), Martin & Piñón (2020) provide a systematic semantic account of French behaviour-like verbs derived from nouns and adjectives in terms of the relationship of *stereotype S*: the interpretation of a verb such as *diplomatiser*, meaning 'to act like a diplomat', can be captured through the stereotype *diplomat*, which does not entail the noun N (i.e., Juliette need not be a diplomat to act like one) but builds upon the facts/properties of N (i.e., politeness, charm, moderation, among others). The verbal suffix *-ise(r)* introduces the stereotype ('act like N'), resulting in the eventuality predicate *diplomatiser*, which further combines with a Voice head (Kratzer 1996) that introduces an external argument (the Agent).

Conversion has also been addressed by various morphological structural theories which attempt to capture how meaning is formed below the word level (Table 1). According to Lexical Syntax (Hale & Keyser 2002), the meaning of denominal verbs can be represented structurally via syntactic rules such as Incorporation/Conflation (*dance* = DO *dance*, *shelve* = PUT ON *shelf*, see further examples in Bleotu 2012; 2013; 2016a). According to Distributed Morphology and similar frameworks (Halle & Marantz 1993; Marantz 1997; Borer 2014, a.o), denominals are derived via

Lexical syntax (Hale & Keyser 2002)	Distributed Morphology (Halle & Marantz 1993)	Spanning (Ramchand 2014)
<pre> graph TD V_prime[V'] --- V[V] V_prime --- NP[NP] V --- Ni[Ni] V --- V[V] NP --- N[N] NP --- ti[ti] Ni --- dance[dance] </pre>	<pre> graph TD V[V] --- V[V] V --- Root[Root] Root --- dance[dance] </pre>	<pre> graph TD init@*[init@*] --- x1['x'] init@* --- Proc*[Proc*] Proc* --- x2['x'] Proc* --- N[N] N --- dance[dance] </pre> <p><i>Linearized as x [N Proc Init]</i></p>

Table 1: Structural accounts of the meaning of denominals.

a process of Merge between a verb and an underspecified root. Another morphological theory, Spanning (Brody 2000; Ramchand 2008; 2014; Svenonius 2012; 2016; Bleotu 2016b; 2019; Blix 2021) argues that denominal verbs represent a span, a word which spells out multiple heads. While resorting to different processes, these theories all try to capture an important intuition about denominal verbs: that their meaning is the result of combining multiple linguistic units into a single form.

According to Kiparsky (1997), denominal verb meaning is only partly explained through structurally merging a light verb with a nominal element. In addition, denominals observe a Canonical Use Principle, relying on world knowledge:

(4) **Canonical Use Principle**

If an action is named after a thing, it involves a canonical use of that thing.

For instance, a verb such as *to tape* does not mean ‘to throw tape at someone’, but rather ‘to cover something with tape’, i.e., ‘to use tape in a typical way’.

The fact that denominal verbs can express a variety of meanings has also been discussed by structural accounts. Kiparsky (1997) distinguishes between two types of denominals: true denominals like *tape*, which cannot combine with other objects than tape (**to tape with pushpins*), and pseudo denominals like *hammer*, which may combine with other objects than hammer, expressing an activity performed in a manner typically associated with the root object (*to hammer with a shoe*). He proposes a structural distinction between the two types, arguing that true denominals merge (light) verbs with nouns, while pseudo denominals merge verbs with roots (Table 2). Roots introduce the component *like N* into the structure and interpretation of pseudo-denominals: for the current hammering activity, the shoe is used like a hammer, though it is not one (see Kiparsky 1997: 16).

True denominals	Pseudo denominals
<pre> graph TD V1[V] --- V2[V] V1 --- N[N] </pre>	<pre> graph TD V1[V] --- V2[V] V1 --- Root[Root] </pre>

Table 2: Types of denominal verbs (Kiparsky 1997).

Whereas Kiparsky (1997) considers this distinction structural, Harley & Haugen (2007) argue that the distinction is pragmatic: while taping with pushpins is impossible, given that pushpins do not have adhesive properties, taping with band-aids is more plausible. Consequently, all denominal types are derived from merging verbs with roots, a view supported by multiple experiments on English native speakers conducted by Bleotu & Bloem (2020; 2021).

While Kiparsky (1997) and subsequent articles have looked at similitive readings of verbs derived from nouns with the thematic roles instrument (*to hammer*), location (*to shelve*), or locatum, i.e., displaced theme (*to butter*), behaviour-related denominal verbs such as *to monkey* ('to act like a monkey') have not been investigated from this perspective. However, 'act like N' readings of denominals can also be looked at from a structural viewpoint.¹ An account in terms of Lexical Syntax could argue that *to monkey* is the result of multiple successive incorporations starting from 'ACT LIKE monkey'. *Monkey* would incorporate into LIKE, and the composite preposition LIKE-*monkey* would then further incorporate into ACT (see (5) and Table 3). In a Distributed Morphology/Spanning framework, the root *monkey* (expressing the meaning 'monkey-like') would simply merge with verbal elements (see (5) and Table 3).²

Lexical syntax (Hale & Keyser 2002)	Distributed Morphology (Halle & Marantz 1993)	Spanning (Ramchand 2014)
<p>A Lexical Syntax tree for the verb 'to monkey'. The root is V', which branches into V and VP. V branches into V and V_k. V_k branches into V and P_j. P_j branches into P and N_i, with 'monkey' under N_i. VP branches into V', which branches into V and PP. V has the trace t_k under it. PP branches into P and NP. P has the trace t_j under it. NP branches into N, which has the trace t_i under it.</p>	<p>A Distributed Morphology tree for the verb 'to monkey'. The root is V, which branches into V and Root. Root has 'monkey' under it.</p>	<p>A Spanning tree for the verb 'to monkey'. The root is init@*, which branches into 'x' and Proc*. Proc* branches into 'x' and N. N has 'monkey' under it. Below the tree, it says 'Linearized as x [N Proc Init]'.</p>

Table 3: Possible structural representations of the denominal verb *to monkey*.

(5) I saw them *monkeying* (around) all day.

Interestingly, most of the theoretical literature on denominal verbs (Hale & Keyser 2002; Halle & Marantz 1993; Marantz 1997; Borer 2014, a.o.) has focused on the array of denominal verbs present in the lexicon. However, looking at more creative/innovative uses of denominals (such as

¹ As well pointed out by a reviewer, behaviour-like verbs may lead to different assumptions than instrument verbs: a speaker asserting *I hammered the desk with my shoe* is not committed to the belief that the shoe has the stereotypical properties of a hammer, but, instead, to the belief that they used their shoe in a hammer-like way (Kiparsky's Canonical Use Principle). However, a speaker asserting *Tom is monkeying* is committed to the belief that Tom has the stereotypical properties of a monkey. The difference between the two might, however, also be related to whether the denominal is used in a(n) (in)transitive frame: *His heart hammered all day* may indicate the speaker's commitment that the heart is like a hammer. Thus, typicality might affect subjects/objects differently.

² As a reviewer suggested, we could also assume (*to monkey* is derived from the noun *monkey* used in a figurative manner (see Bleotu & Bloem 2020; 2021 for an account along these lines, in terms of merging V with an OBJECT TYPE N). This would be contrary to the general assumption made in this paper that nouns are interpreted in a literal manner (by default).

those in (3), labelled as *contextuals* by Clark & Clark 1979) is essential for establishing what can be ascribed to syntax and what can be ascribed to extralinguistic information.

2.2 Previous research on denominal verb comprehension in adults

Kelly (1998) investigated verbs derived from rules such as *to dance the X*, *to play the X*, or *to travel by X* as opposed to idiosyncratic denominals such as *to monkey*, *to chair*, or *to eye* through several (production, comprehension, and paraphrasing) experiments, and found that rule-derived verbs are easier to produce, comprehend and paraphrase than idiosyncratically derived ones. Štekauer (2005; 2006) and Štekauer, Díaz-Negrillo, & Valera (2011) asked participants to give all possible meanings of novel denominal verbs and rate the likelihood of such meanings on a 1–10 Likert scale. They found that participants tended to associate certain conceptual fields with specific relations (e.g., Animal denominals tend towards the relation OBJECT, followed by MANNER, Fruit denominals tend towards the relation OBJECT, the field Furniture tends towards INSTRUMENT and LOCATION, a.o.).

Recent work by Bleotu (2017), Bleotu & Ivan (2022; to appear) has looked at the interpretation of denominals by Romanian native-speaking monolingual adults. Speakers had to provide paraphrases and sentences for SAD verbs with and without the reflexive clitic *SE*, corresponding roughly to '(one)self'. Interestingly, *SE* clitic denominal verbs receive more 'become like N' and 'act like N' interpretations than denominal verbs without clitics. *A se cireși* 'to SE cherry', for instance, is understood as 'to become like a cherry' ('to blush', 'to become red') more than *a cireși* 'to cherry'. This shows that denominal verb interpretation is not only determined by the root but also by the morpho-syntactic frame in which a denominal verb is used.

Thus, adults seem to be sensitive both to the make-up of denominal verbs (Kelly 1998; Štekauer 2005; 2006; Štekauer, Díaz-Negrillo & Valera 2011), as well as to the syntactic environment in which they occur (Bleotu 2017; Bleotu & Ivan 2022; 2023).

2.3 Denominal verbs in child language

Denominal verbs have also been investigated in child language, which shows numerous cases of morphological creativity. Children start coining novel denominal verbs from as early as 2 (Bowerman 1982a; Clark 1982; 1993; Clark & Berman 1984; Kuczaj 1978; Oshima-Takane, Barner, Elsabbagh, & Guerriero 2001). Based on personal longitudinal records of 2- and 3-year-olds and other sources, Clark (1982) provides multiple examples from child language with coined denominals, derived from nouns present in the child's vocabulary. The examples involve various denominal verb types: instrument verbs (i.e., verbs which incorporate the instrument), locatum verbs (i.e., verbs which incorporate the Locatum, a displaced Theme), location verbs (i.e., verbs which incorporate the Location)-see **Table 4**, as well as characteristic activity verbs, meaning "do as X does", which are very frequent in child language but not so frequent in adult language (**Table 5**).

Instrument verbs	Locatum verbs	Location verbs
(1) S (2;7): having hit his baby sister, explaining what made her cry): <i>I broomed her.</i> [= hit her with a (toy) broom]	(1) DH (2;3, talking about getting dressed?): <i>Mummy trousers me.</i>	SO (ca. 5;0): <i>I'm going to basket those apples.</i>
(2) S (3;0,21, watching a man opening a door with a key): <i>He's keying the door.</i>	(2) J (2;6, asking a teacher to toss a pillow at him during a mock pillow fight): <i>Pillow me!</i>	
(3) S (3;2, pretending to shoot his mother with a stick): <i>I'm going to gun you.</i>	(3) CB (3;11, putting crackers in her soup): <i>I'm cracker-ing my soup.</i>	

Table 4: Examples with instrument, locatum and location verbs coined by English-speaking children (Clark 1982).

Characteristic activities	
Act of	Act done to
(1) EB (2;3, when the stove timer went off): <i>The buzzer is buzzing.</i>	(1) S (2;4, to mother preparing to brush his hair): <i>Don't hair me.</i>
(2) RG (3;0, wanting a bell to be rung): <i>Make it bell.</i>	(2) S (2;4, eating soup): <i>I'm souping.</i>
(3) S (3;0, watching a truck go by): <i>It's trucking.</i>	(3) J (2;6, seated in a rocker): <i>Rocker me, mommy.</i>
	(4) S (2;8,15, hearing his father using the vacuum cleaner in the hall: <i>Daddy's rugging down the hall.</i> (Later, going out to help): <i>I'm helping rug.</i>
	(5) S (2;9, overheard talking to another child while outside playing with a toy lawn mower): <i>I'm lawning.</i>

Table 5: Examples with characteristic activity verbs coined by English-speaking children (Clark 1982).

On the one hand, children's innovative denominals show that children can turn nouns into verbs, extending their understanding to novel categories, as also discussed in Oshima-Takane, Miyata, & Naka (2000). On the other hand, children often produce novel denominals that an adult would not come up with. This happens because adults observe an *innovative denominal verb convention* (Clark & Clark 1979): they associate nouns denoting entities with states/processes/activities judged as typical for that entity based on the speaker's and hearer's mutual knowledge while taking already existing forms into account. Thus, *sweep* normally pre-empts *broom*. In contrast, children use any noun denoting a concrete entity as a verb to talk about a state, process, or activity associated with that entity. Unlike adults, children often use the same noun both as a denominal verb and an argument for the verb (*Make it [the bell]*

bell), they lack awareness of pre-empting vocabulary (*sweep* normally pre-empts *broom*), and they are unable to judge mutual knowledge between them and their interlocutor as easily as adults.

Polysemous verb-noun pairs also pose another challenge for acquisition in English, given that, if one assumes a one-to-one mapping between a form and its meaning (Slobin 1973), children may have problems understanding that the same word can be used as both a noun and a verb.

While Conwell & Morgan (2012) have claimed that children learn nouns and verbs derived from nouns separately from the parent input, the existence of cross-categorial extensions to verbs that are inexistent in the adults' language such as *to broom* can be taken as evidence that class extension strategies must be in place. However, caution is needed. Although coined denominal verbs appear in production very early, children might not truly understand these verbs in an adult-like fashion. Bushnell & Maratsos (1984), for instance, asked English-speaking children of various ages to act out sentences containing novel denominals such as *Can you truck a basket?* While 5- and 7-year-olds correctly acted out the sentences, 2-year-olds did so only about half of the time. In Bushnell & Maratsos's (1984) view, 2-year-olds' spontaneous denominal coinages might hence be a result of immature sentence comprehension strategies. Berman (2000) also conducted several structured elicitation tasks (see (6)) on Hebrew-speaking children of various ages and found that starting at age 4, children are more accurate in coining novel denominal verbs (such as *beading*) from familiar nouns:

(6) I'm putting these beads in a box. What am I doing to the beads?

However, previous results (Bushnell & Maratsos 1984; Berman 2000) might not accurately reflect the age of acquisition of class extension strategies, given the complexity of the tasks used. To have a more accurate picture, Lippeveld & Oshima-Takane (2011; 2013; 2020) investigate French 2- and 3-year-old children's ability to comprehend novel instrument denominal verbs through an Intermodal Preferential Looking Paradigm (Hirsh-Pasek & Golinkoff 1996), a paradigm which relies on eye gaze as a response to the task questions. This is preferable for young children, who may experience difficulties with tasks asking them to give an explicit verbal or non-verbal (act-out) response. Children were introduced to various objects carrying novel labels through short videos presenting the typical action associated with the objects: (*le*) *vop* (i.e., a bottle opener), (*le*) *dax* (i.e., a cheese grater), and (*le*) *ploun* (i.e., pastry cutter). Children then saw two other objects in action side by side, and they were told: "Look at the one that is *voping!*". Importantly, unlike 2-year-olds, 3-year-old children looked longer in the direction consistent with class extension, correctly identifying the object performing the *voping* action. This suggests that 3-year-olds possess class extension strategies. Interestingly, there seems to also be a correlation between the number of words mothers use cross-categorially (Lippeveld & Oshima-Takane 2015) and

children's performance with novel noun-verb pairs, as shown by investigating the parental input children were getting during play sessions. This could easily be accounted for within a model where the two meanings are extensions of the same word (Copesake & Briscoe 1995; Tyler & Evans 2001) rather than two distinct lexical entries (Murphy 2007; Srinivasan & Snedeker 2011).

The idea that children understand the relation between denominal verbs and nominal meaning is also supported by experimental work by Srinivasan, Al-Mughairy, Foushee & Barner (2017): after being taught a novel word (e.g., *daxing*) referring to an activity involving a novel instrument and a novel patient, children had to choose the referent of a second novel word (e.g., *Show me the kiv*) between the instrument and the patient. Children associated *kiv* with the patient, thus revealing that they understood *the dax* to refer to an instrument. Not only do children understand the denominal and the verb in a related manner, but they seem to favour the instrument over the patient meaning.

2.4 Denominal verbs as a window into compression and meaning preferences in child language

2.4.1 The Meaning First Approach. Denominal verbs as a case of meaning compression

A fundamental property of (novel) denominal verbs is that only part of their meaning is overtly spelled-out, as it becomes clear when considering the unexpressed (verbal and prepositional) structure postulated in multiple theories (See **Tables 1** and **3** in Section 2.1, for instance). The meaning of denominals is compressed, implicit rather than explicit, i.e., *(to) cherry* means much more than *cherry* (it could mean 'to eat cherries', 'to pick cherries', 'to become like a cherry', a.m.o.). Children have to figure out the interpretation in the absence of an explicit expression of the underlying meaning of the verb. If children have no difficulties decompressing implicit structures, then they should treat explicit and implicit structures in a similar fashion. However, recent work suggests that children might have difficulties with meaning compression (see Martin, Nie, Alexiadou & Guasti 2022; Guasti, Alexiadou & Sauerland 2023). To shed light on this important point, we assume the Meaning First Approach (Sauerland & Alexiadou 2020), a recently developed generative conceptual framework that relies on the idea that language is compression of thought. According to this approach, conceptual representations are built out of innate conceptual primitives, and they are compressed (linearized and articulated) into various linguistic forms based on various factors (linguistic rules, economy, context, a.o.). This model of grammar involves a Generator component and a Compressor component (see Guasti, Alexiadou & Sauerland 2023). The Generator—which is located in the Thought-system and is language-independent—is the structure-building engine that generates complex conceptual representations (CRs) out of primitives (such as causation, agency, conjunction, negation). The Compressor is the morpho-syntactic linguistic engine responsible for linearization, i.e., deciding which meaning components get articulated by which lexical items and in what order. Compression of meaning is tightly related to the likelihood of being understood

by other interlocutors: thus, speakers are less likely to compress if this leads to difficulties for the interlocutor. In the case of children, the Meaning First Approach predicts that, if a concept occurs in a conceptual representation, children will realize it lexically (*Child Language Undercompression Hypothesis*, see Guasti, Alexiadou & Sauerland 2023). This seems to be the case indeed. While adults generally prefer compressing conceptual structures, we find that children seem to opt for a one-to-one correspondence between concepts and forms (Slobin 1973), making *undercompression errors*, i.e., production errors where they tend to express the underlying conceptual structure. Support for this comes from Martin et al. (2022), who conducted a corpus study on causatives in child French and found out that, unlike adults, French children younger than 4;6 express the implicit causative component of transitive verbs through the verb *faire* 10% of the time:

(7) *Causative*

Va **faire** **le couper**

go CAUSE it cut

‘Going to cut it.’

(Anais, 2;9, Lyon)

Interestingly, causative *faire* occurs mostly with causative verbs but it is very rarely used with verbs that lack causative semantics such as *manger* ‘eat’ or *pleurer* ‘cry’. This shows that children’s production errors reflect an initial tendency to undercompress/fully make explicit the meaning of causative transitives and to express a concord pattern. This is also reflected in children’s use of double negation to express a negative meaning (*She didn’t buy nothing*- see Thornton, Notley, Moscati & Crain 2016) or of double comparatives to express one single comparison (*plus mieux* ‘more better’ in French). Interestingly, the tendency towards concord manifests not only in production but in comprehension as well, where children interpret meaningful causative morphemes as semantically superfluous (in particular, Japanese children interpret ‘The monkey had (someone) open it’ as ‘The monkey opened it’- see Yamakoshi et al. 2018) or they interpret double negation as negative concord (Nicolae & Yatsushiro 2020). Other examples of *undercompression errors* produced by children (see Guasti, Alexiadou & Sauerland 2023) involve dependencies (children tend to lexicalize the unpronounced trace a DP is associated with, as in *the one that he lifted it* or *the song about the airplane that we’re riding in an airplane* (3;9)) and antonymic concepts (children tend to produce both the positive and the negative members of a set together, as in *mit ohne Butter* ‘with without butter’).

Based on such findings from production, we hypothesize that children should have an easier time with transparent mappings of concepts and forms in comprehension as well. We thus put forth the *Compressed Meaning is Hard Hypothesis*:

(8) *Compressed Meaning is Hard Hypothesis*

Children initially have more ease with explicit meaning.

Our hypothesis is in line with previous proposals about acquisition, which argue that children have an initial bias towards transparency (Slobin 1973; van Hout 1998). As discussed by Guasti, Alexiadou & Sauerland (2023), the Meaning First Approach assumes that children have to map conceptual representations to language and, consequently, predicts that they should have more ease with transparent one-to-one mappings of concepts and forms, which present the advantage of avoiding ambiguity, than with covert and/or conflated ones (many-to-one). This leads to the prediction that children should have more difficulty interpreting SAD verbs, which are compressed forms, than explicit structures which separately spell out the event(s) or state(s) involved and the corresponding nouns/nominal roots. Thus, children should have more ease with ‘to eat cherries’ and with ‘to become like a cherry’ than with ‘to cherry’, and they should also have more ease with ‘to catch a fox’ and ‘to behave like a fox’ than with ‘to fox’ in the corresponding pragmatic contexts.

In addition, we can also make some predictions regarding the *decompressed meanings* children prefer to ascribe to denominals: children may differ from adults in their decompression preferences, opting for simplicity over plausibility or world knowledge. A *cireşi* ‘to cherry’ allows a wide range of possible uncompressed meanings: both literal ones (e.g., ‘to eat cherries’) and figurative ones (e.g., ‘to become (red) like a cherry’, i.e., ‘to blush’). In the absence of any disambiguating context, children might observe a *Principle of Simplicity in Decompression* such as (9), and, consequently, they might prefer the simpler, literal meanings (doing an activity that involves actual cherries) over the more complex ones which involve both a more complex verbal component (e.g., the change-of-state meaning ‘come to be’) and a more complex noun-like component (*like a cherry*).

(9) *Simplicity in Decompression Principle*

When a novel word may have multiple meanings, children decompress to the simpler meaning by default.

Simplicity may be understood in terms of structural semantic meaning. Literal meanings result from merging V with a noun, while figurative meanings result from merging V with a LIKE N component. This component may be represented as a ‘LIKE N’ structure or it may be considered a root (**Table 2**) (Kiparsky 1997) or even an OBJECT TYPE N (Bleotu & Bloem 2020; 2021), which acquires a manner/property reading in the context. Children are exposed to many nouns, and they can map (novel) nouns to objects/entities from early on (Echols & Marti 2004; Fennell 2006; Waxman & Booth 2001, a.o.). In contrast, *n*-like similarity is more semantically complex than noun meaning. Moreover, there may be an additional difference between literal and figurative interpretations of denominal verbs in terms of the light verbs occurring in their make-up: literal readings of denominals may be argued to involve the light verb DO (like *eating*, *picking*, among others)-which we shall refer to as *DO-type verbs*- these are prototypical events, and,

from an aspectual viewpoint, they are also simpler than changes of state, which may be argued to compose figurative interpretations (e.g., *BECOME like a cherry* = ‘*COME TO BE*’). Given these considerations, we may expect children to generally prefer literal over figurative interpretations of denominals in the absence of context.

Associating ambiguous words with simpler meanings would imply that children observe a hierarchy in their mapping preferences: they initially opt for One-to-One mappings (Slobin 1973; Clark 1987), and, in case such mappings are not possible, their next preference is to map a form to as few concepts as possible.

In the presence of a supportive context, however, children may decompress the adequate meanings if their sensitivity to context is strong (see Section 2.4.3). Interestingly, while early theories of polysemy argue for an innate bias for associating a word with a single category and a single meaning (Markman 1989), more recent approaches suggest that polysemy may be widespread and available in child language (Ramiro, Srinivasan, Malt, & Xu 2018; Srinivasan & Rabagliati 2015; 2021). 2-year-olds can recognize multiple meanings of polysemous words, as shown by a recent eye-tracking study (Floyd, Goldberg & Lew-Williams 2020). Moreover, 4–7-year-olds can learn polysemous words, relying on the relation between the different meanings (Srinivasan, Berner & Rabagliati 2019), in particular, the relation of similarity (Floyd & Goldberg 2020). Young children can also interpret nonce denominals in a ‘figurative’ way, focusing on the manner of the activity (Lippeveld & Oshima-Takane 2011; 2013; 2015; 2020) in a context involving direct visual contact with the entities and actions at issue. In the presence of a supportive context, 5-year-old children might thus be able to interpret *to cherry* as meaning ‘to become (red) like a cherry’, not just as ‘to eat/pick cherries’. If, however, meaning extension in terms of similarity is more challenging (see Section 2.4.2) and children’s preference for simpler meanings is stronger, they might still prefer simpler meanings, i.e., literal meanings- which would not be infelicitous in the context.

According to the Meaning First Approach and the *Compressed Meaning is Hard* hypothesis, *explicit meaning should thus be easier than implicit meaning*. Note that, while implicitness may occur in the absence of compression in various situations, for instance, with implicit arguments (see Bhatt & Pancheva (2017) for an overview³), in the particular case of denominal verbs, compression and implicitness go together. Compressing multiple meaning components into a denominal results in those meaning components becoming implicit while decompressing them makes them explicit. Children should have less difficulty making sense of explicit meanings. This holds for literal meanings, but it might also hold for figurative meanings (‘to become like a cherry’,

³ Bhatt & Pancheva (2017) discuss implicit agents with passives (*This ship was sunk [PRO to collect the insurance]*), benefactive adjectives (*It is wise [PRO] to go*), implicit agents of nouns (*the playing of the game [PRO to prove a point]*), implicit agents of agentive suffixes (*Goods are exportable [PRO to improve the economy]*), and even null objects (*This leads (people) to the following conclusion*).

‘to behave like a fox’). While the explicit paraphrases of figurative meanings of SAD verbs are still open to several interpretations (e.g., ‘to be sly’, ‘to steal’, ‘to lie’ for *to fox*), these interpretations are fewer than all the possible interpretations for the corresponding implicit denominal, which include both figurative and literal interpretations. However, figurative meanings might generally be more challenging for children, whether explicit or implicit. If the comparison *like a cherry/a fox* is provided, children would be made aware that the meaning is figurative. However, they would still need to rely on additional world knowledge (involving similarities between objects) to figure out in what respect the meaning is figurative (e.g., size, colour, shape). Consequently, although the explicit figurative meaning is easier than the implicit figurative meaning, it might still be harder than the literal meaning.

Further insight into the matter comes from cognitive accounts of various types of figurative meanings.

2.4.2 Is explicit figurative meaning the same as implicit figurative meaning? A cognitive perspective

From a cognitive perspective, figurative interpretations of SAD verbs should be more problematic than literal ones. To derive an adult-like figurative interpretation, children should (a) understand that the meaning is *figurative* and (b) understand *how* the meaning is figurative, i.e., in principle, children could understand that a LIKE component is involved, but still not be able to identify the relevant properties underlying the comparison (we owe this important remark to one of our anonymous reviewers). Children are known to have difficulties with figurative meanings between the ages of 3–5, and it has been shown that there is a developmental path in metaphor comprehension (Billow 1975; Gentner 1988; Johnson & Pascual-Leone 1989; Nall 1983), with older children performing better than younger ones. This is because figurative meanings are cognitively more complex than literal meanings: understanding figurative meanings involves identifying the similarities between objects, establishing relations between those similarities, and integrating them into a new concept (Paivio 1979; Lakoff & Johnson 1980; Recanati 2004; Rubio-Fernández 2007). Children also have more limited world knowledge than adults, therefore, a more limited capacity to identify prototypical similarities between objects. While children may be aware of other types of similarities, requiring less cultural knowledge, children may lack the ability to identify stereotypical similarities. Consequently, we would expect them to experience difficulties with figurative readings of SAD verbs.

An important question is whether children do better with certain types of figurative meanings than with others (Song 2020). The existence of a possible difference between implicit figurative meaning (such as *metaphor*) and explicit figurative meaning (such as *simile*) has been a matter of debate. According to the traditional comparison view (Miller 1974; Miller & Johnson-Laird 1976; Miller & Glucksberg 1988; Ortony 1979; 1993; Gentner & Bowdle 2008; Glucksberg, Newsome

& Goldvarg 2001), going back to Aristotle, similes are explicit comparisons, whereas metaphors are implicit comparisons. Nevertheless, they essentially represent the same figure of speech asserting the analogy between an object X and an object Y. Metaphors are simply a form of conventionalized comparison. Figuring out the meaning of a metaphor or a simile involves (i) first deriving the literal meaning, (ii) then assessing the interpretability of that meaning, (iii) deriving the non-literal meaning if the literal meaning does not work. Such accounts use data from simile interpretation as evidence for general figurative meaning interpretation (e.g., Gentner 1977; Vosniadou & Ortony 1983). They predict that children should treat implicit figurative meanings and explicit figurative meanings similarly. Thus, on the assumption that denominal verbs involve metaphors (Štekauer 2005; 2006), children should understand *Mary cherried when John told her she is beautiful* with the same ease as *Mary became like a cherry when John told her she is beautiful*.

According to accounts that treat similes as different from metaphors, metaphors represent class-inclusion categories: a statement such as *x is a y* should be understood as ‘*x* is a member of the category in which *y* is a prototype’ (Glucksberg & Keysar 1990). In contrast, similes should be understood as comparison statements (Glucksberg & Haught 2006). This is the perspective adopted by Relevance Theory, according to which, while simile comprehension involves comparing the properties of two literal concepts, metaphor comprehension involves constructing an ad-hoc concept that fits the context, thus leading to broadening or narrowing the meaning (Carston 2002; Sperber & Wilson 2008). Chiappe & Kennedy (2001) and Roncero et al. (2006) even argued that metaphors express a stronger meaning than similes since *X being a cherry* involves more similarities between *X* and the object *cherry* than *X being like a cherry*. The idea of a difference between similes and metaphors has been supported by eye-tracking-while-reading studies indicating longer reading times and higher rate of regressions for metaphors than for similes in adults (Ashby, Roncero, de Almeida, & Agauas 2017), as well as by several child language studies showing that similes are easier to understand than metaphors (e.g., Reynolds & Ortony 1980; Seidenberg & Bernstein 1986; Siltanen 1990). Such accounts predict that children should handle similes such as *become like a cherry* in *Mary became like a cherry when John told her she is beautiful* more easily than the *(to) cherry*, which carries an implicit figurative meaning. This prediction is also partly supported by a previous study by Özçalışkan, Goldin-Meadow, Gentner, & Mylander (2009), who found that, after acquiring the word *like*, hearing children shift from primarily expressing global similarity (*cat/tiger*) to primarily expressing single-property similarity (*the crayon is brown like my hair*), unlike deaf children. Consequently, the authors argued that the explicit marker *like* might foster similarity comparison.

Interestingly, the predictions made by theories that postulate *the non-equivalence of metaphors and similes* (*Mary is a cherry* versus *Mary is like a cherry*) are somewhat similar to the predictions made by the Meaning First Approach about uncompressed figurative meaning being easier than compressed figurative meaning.

Theories that consider metaphors different from similes (*Mary is a cherry* vs. *Mary is LIKE a cherry*) predict that similes should be easier for children than metaphors. *Mary is a cherry* (or *Mary cherried*) does not tell participants directly what type of meaning they should embrace (literal/figurative), but this is something they should infer by relying on the knowledge that humans cannot be cherries, they can only do various things with cherries (e.g., eat, pick) or be like cherries in a certain sense. In contrast, the presence of the explicit marker *like* in the simile *Mary is like a cherry* makes figurative readings directly available, removing literal interpretations from the array of possible interpretations. On the other hand, theories that treat metaphors on a par with similes, assuming that metaphors also involve a LIKE component, predict that children should treat *Mary is a cherry* and *Mary is like a cherry* alike.

As far as the Meaning First Approach is concerned, it assumes that transparent structures (with a one-to-one mapping of meaning to forms) should be easier to acquire than non-transparent structures. If non-transparent figurative denominals involve an implicit LIKE component, then explicit similes using *like* should be easier for children, given that the LIKE component is directly accessible in *become like a cherry* and not something to be inferred. If, on the other hand, we assume that, in non-transparent figurative denominals, a light verb simply combines with a root (Kiparsky 1997), then children should still perform better with explicit figurative structures, since, for implicit figurative denominals, they would have to figure out the verb in the underlying structure, whereas for explicit figurative structures, the verb is directly accessible.

2.4.3 Sensitivity to Context Approach

Another possibility is that, although, in the absence of any context, children might handle explicit meanings better than implicit meanings, in the presence of supporting context, children actually handle implicit meanings with just as much ease as explicit meanings. Previous research has shown that context plays a very important role in metaphor understanding (Vosniadou 1989; Cameron, 1996; 2003; Özçalışkan 2007; Waggoner, Palermo & Kirsh 2017). In the absence of any context, 4-year-olds have difficulties understanding motion metaphors, for instance. However, when sufficient context is provided, the difficulties fade away. If children are extremely sensitive to context, figurative meanings should pose no extra challenges compared to literal meanings. Thus, the *Simplicity in Decompression Principle* might be overridden by the *Plausibility in Decompression Principle*:

(10) *Plausibility in Decompression Principle*

When a novel word may have multiple meanings, decompress to the most plausible meaning, given context and world knowledge.

While we expect adults to show sensitivity to context and world knowledge, it is unclear whether children show the same level of sensitivity.

For convenience, **Table 6** lists our general expectations about children’s handling of SAD verbs according to the theories discussed. Interestingly, while all the accounts presented below make predictions about figurative meanings, only the Meaning First Approach makes a prediction about literal meanings, i.e., that implicit literal meanings should be harder than explicit literal meanings. It bears mentioning that the approaches in **Table 6** may combine in mutually non-exclusive ways if participants compute meaning both structurally and cognitively– we come back to this matter in the discussion.

Accounts	Explicit vs Implicit Meaning	Literal vs Figurative Meaning
Meaning First Approach	Implicit meaning is harder than explicit meaning	Figurative meanings are harder than literal meanings
Implicit figurative meaning is not explicit figurative meaning	Implicit figurative meaning is harder than explicit figurative meaning	
Implicit figurative meaning is explicit figurative meaning	Implicit figurative meaning is just as easy as explicit figurative meaning	
Sensitivity to context	Implicit figurative meaning is just as easy as explicit figurative meaning	Figurative meanings are just as easy as literal meanings in the presence of supportive context

Table 6: Predictions about children’s interpretation of SAD verbs according to different approaches.

3 Experiments on denominal verbs in child Romanian

3.1 Denominal Sentence and Paraphrase Elicitation Task

Bleotu (2021) used a **Denominal Sentence and Paraphrase Elicitation Task** involving SAD verbs. 19 Romanian monolingual children (10 Male, 9 Female; Mean age: 4;09; Age range: 3–5) and 40 Romanian native adult speakers were asked to provide examples of sentences with SAD verbs and explain what the SAD words meant through paraphrases. The study set out to see participants’ interpretative preferences for SAD verbs when unconstrained by other speakers or by context, as well as their choice to produce SAD verbs in (in)transitive frames and with (in)animate subjects.

Bleotu (2021) employed 16 possible, but nonexistent denominal verbs, belonging to four classes: animals (*a vulpi* ‘to fox’), human roles (*a mătuși* ‘to aunt’), plants/vegetables (*a cireși* ‘to cherry’), objects/places (*a chitări* ‘to guitar’). All verbs involved a nominal root and a verbal marker (*-i, -a*), which turns the root into a verb but seems to be otherwise semantically empty in current Romanian. This marker is compatible with all types of verbal meanings (see Bleotu 2019 for a more extensive discussion of its contribution and structural position in the verbal domain). Participants were asked to provide a sentence and a paraphrase for each denominal.

Regarding interpretative preferences, children were found to provide more literal paraphrases than figurative ones for both SAD verbs derived from animate and inanimate roots (**Figure 1**, **Table 7**, see Bleotu 2021 for more details on the results and statistical analysis). In contrast, adults provided mostly literal paraphrases for SAD verbs derived from inanimate roots, but mostly figurative paraphrases for SAD verbs derived from animate roots (see Bleotu 2021; 2022).

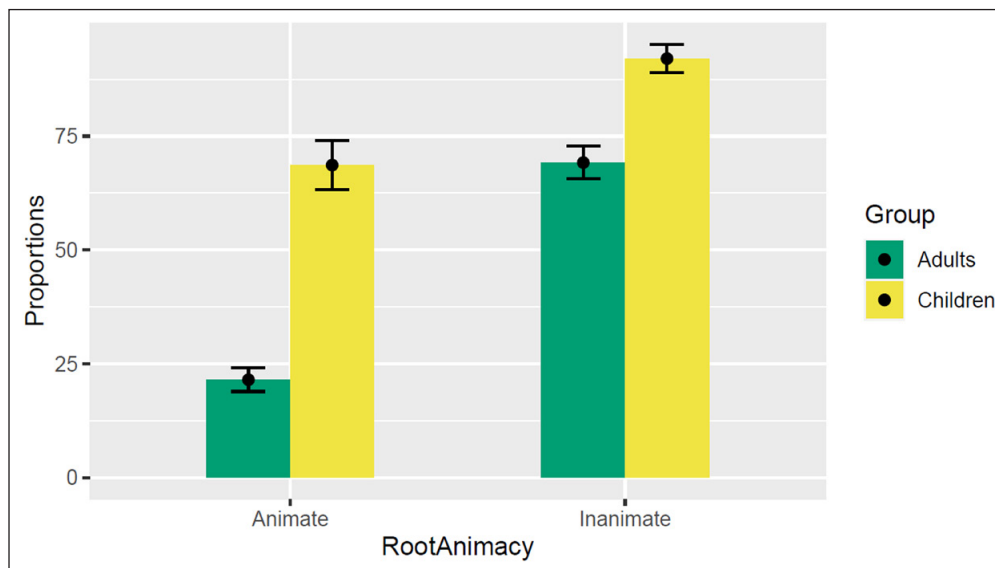


Figure 1: Proportion of literal paraphrases per Group and Root Animacy in the Elicitation Task Error bars reflect Standard Error (SE).

Children mostly understood *cherrying* as referring to a canonical activity involving cherries (such as picking/eating cherries) and *foxing* as a canonical activity involving actual foxes (such as catching foxes). Children’s literal bias is in line with *Simplicity in Decompression*, according to which children should decompress to the simplest meanings, i.e., literal meanings which have a simpler semantic structure than figurative meanings (see Section 2.4.1). Literal meanings are also cognitively simpler than figurative meanings, which involve more conceptual work: identifying and relating similarities (see Section 2.4.2). In contrast, adults’ preference to interpret SAD verbs derived from animates as ‘become like N’/‘act like N’ can be explained in terms of their world knowledge and of a tendency at work in the lexicon to compare humans to animals in terms of their physical aspect/behaviour (e.g., moving stealthily like a fox, or slowly like an elephant, hopping like a bunny). Children are not as figurative, possibly because they are not so aware of the prototypical properties of animals that serve to characterize humans. Also, stories often talk about human-animal interactions, and children interact with cartoon animals often, which may lead to more literal interpretations of denominals.

Denominal verbs		Children		Adults	
		Sentence answers	Paraphrases	Sentence answers	Paraphrases
<i>a cireși</i> 'to cherry'	Lit	<i>Eu cireșesc.</i> 'I am cherrying.'	<i>a mânca cireșe</i> 'to eat cherries'	<i>Eu cireșesc în grădină.</i> 'I am cherrying in the garden.'	<i>a culege cireșe</i> 'to pick cherries'
	Fig	Missing		<i>A cireșit la auzul spuselor lui.</i> 'She cherryed at hearing his words.'	<i>a se îmbujora, a se face roșu ca cireașa</i> 'to become red in the cheeks, to become red like a cherry'
<i>a vulpi</i> 'to fox'	Lit	<i>Lupul vulpește.</i> 'The wolf is foxing.'	<i>a prinde o vulpe</i> 'to catch a fox'	<i>Vânătorul și soția sa au vulpit creatura care le măcelărise păsările din coteț.</i> The hunter and his wife foxed the creature that had butchered the birds from the coop.	<i>a jupui o vulpe</i> 'to flay a fox'
	Fig	<i>Pisica vulpește.</i> 'The cat is foxing.'	<i>a pândi ca o vulpe</i> 'to prowl like a fox'	<i>A vulpit-o cu niște vorbe frumoase.</i> 'He foxed her with some beautiful words.'	<i>a păcăli ca o vulpe</i> 'to trick like a fox'

Table 7: Examples of sentences and paraphrases provided by Romanian children and adults.

In addition, both children and adults produced mostly sentences with animate subjects, in line with a well-known animacy bias, leading to animate nouns often being subjects or topics (Givón 1983; Dahl & Fraurud 1996), given that they are higher on an accessibility scale (Arnold 2010; Bock & Warren 1985; Branigan & Feleki 1999; Branigan, Pickering & Tanaka 2008). Children were even more restricted in their subject choices, preferring, for example, to talk about *I, mommy, daddy*.

Also, both children and adults mostly produced intransitive denominal verbs. Interestingly, children are known to show a transitivity bias with verbs early on, overgeneralizing intransitives to transitive structures (e.g., *I disappeared it, You cried her!*) more than the other way round (Ambridge & Ambridge 2020; Bowerman 1982b; Brooks, Tomasello, Dodson, & Lewis 1999). However, the results of Bleotu (2021) show an intransitivity bias. A possible explanation, also corroborated by the paraphrases, might be that children and adults produced more intransitive

than transitive frames because they interpreted denominals as covert transitives which have incorporated their object (Hale & Keyser 2002).

3.2 Current experiments: Denominal verbs and paraphrases in the presence of supporting context

To investigate Romanian children's interpretation of denominals, we move from elicitation to comprehension, exploring whether their literal bias still holds when they must interpret SAD verbs in linguistic contexts which favour 'become/act like' readings rather than literal ones. In a *Contextual Denominal Task*, we targeted Romanian children's understanding of figurative versus literal meanings in context. In a subsequent *Contextual Explicit Denominal Paraphrase Task*, we targeted children's understanding of implicit meanings versus explicit meanings in context, in particular, the contrast between implicit figurative meanings and explicit figurative meanings.

3.2.1 Contextual Denominal Task

We conducted a *Contextual Denominal Task*, a picture selection task where children were exposed to critical sentences containing SAD verbs like *a cireși* 'to cherry' embedded in a certain pragmatic context, creating a bias either for literal or figurative interpretations. We wanted to see whether Romanian children handle figurative interpretations better when there is supporting pragmatic context.

3.2.1.1 Predictions

Based on previous results from the *Denominal Sentence and Paraphrase Elicitation Task*, we expect children to generally be more literal-biased than adults, who should observe a *Plausibility in Decompression Principle*. That children should prefer literal interpretations of SAD verbs over figurative interpretations is predicted by the *Simplicity in Decompression Principle* within the Meaning First Approach, as well as by cognitive accounts, which all assume that figurative meanings are harder than literal meanings. However, if sensitivity to supporting context is strong, children might be able to interpret SAD verbs figuratively in figurative-biased contexts (**Table 7**). Moreover, we expect them to provide more figurative interpretations for SAD verbs derived from animate nouns and in sentences with animate subjects, as suggested by their answers in the *Denominal Sentence and Paraphrase Elicitation Task*.

3.2.1.2 Participants

57 Romanian monolingual typically-developing children (Age range: 4–6) and 33 Romanian adult native speakers took part in the experiment. Children were recruited from No. 248 Kindergarten

and Dreamland Kindergarten in Bucharest. They represented 3 different age groups: (i) 20 4-year-olds (12 Male, 8 Female, Age range: 4–4;9, Mean age: 4;18), (ii) 18 5-year-olds (7 Male, 11 Female, Age range: 5–5;11, Mean age: 5;01), and (iii) 19 6-year-olds (5 Male, 14 Female, Age range: 6–6;7, Mean age: 6;18). The adult controls were undergraduate students at the University of Bucharest and received course credit for participation.

3.2.1.3 Procedure & materials

The experiment employed a picture selection task. Participants heard several sentences containing SAD verbs in 2 types of contexts (literal and figurative)-see **Table 8**. Afterwards, they had to choose the picture that best fit the sentence out of two pictures (a picture corresponding to a literal interpretation, and a picture corresponding to a figurative interpretation). The pictures depicted the literal and figurative interpretations that children and/or adults produced most frequently in the **Denominal Sentence and Paraphrase Elicitation Task**. There were 32 sentences (half with animate subjects, half with inanimate subjects) containing 8 intransitive SAD verbs. While the elicitation task in Bleotu (2021) employed verbs from four classes (plants/vegetables, objects, animals, human roles), we here only chose verbs from two classes: the fruits and vegetables class (*a cireși* ‘to cherry’, *a lămâi* ‘to lemon’, *a cepui* ‘to onion’, *a dovleci* ‘to pumpkin’) and the animal class (*a vulpi* ‘to fox’, *a pinguini* ‘to penguin’, *a elefânți* ‘to elephant’, *a iepuri* ‘to bunny’). Verbs derived from human roles like *mother* or *father* would require a more complex representation involving multiple characters and the relations between them. Equally, figurative readings involving objects (i.e., where someone/something becomes/acts like an object) are not trivial to represent, and, in addition, as already shown in the **Denominal Sentence and Paraphrase Elicitation Task** (see Section 3.1), they involve a rather uncommon association, as people, for instance, are not often compared to objects. In contrast, verbs derived from vegetable/fruit names and animal names are familiar to children and easy to represent visually both in their literal and figurative readings. We manipulated figurative meanings such that for animate roots, the meaning was ‘act like N’, and for inanimate roots, the meaning was ‘become like N’. Moreover, we chose to expose participants to SAD verbs in intransitive frames rather than transitive frames, based on the results from the **Denominal Sentence and Paraphrase Elicitation Task**, where both children and adults almost exclusively produced intransitive sentences with SAD verbs. Since the natural tendency was to produce intransitive structures, we decided to only use intransitive verbs in our experiment.

While the elicitation task offers insights into children’s interpretative preferences, it is important to acknowledge some methodological limitations of our investigation, nonetheless. The task may involve additional challenges related to preemption: more specifically, to interpret a verb such as *to cherry* as meaning ‘to blush’, participants need to suppress the already existing verb ‘to blush’, which has a similar meaning. This may be difficult for children to do, given their

initial preference for pairing one meaning with one single form (Slobin 1973) and Clark’s (1987) principle of contrast, proposing that any difference in form in a language marks a difference in meaning. Thus, children may reason: if a word with that meaning already exists (*to blush*), this new word I am now hearing must mean something else (*to cherry*). However, children sometimes fail to use preemption (Clark & Clark 1979), producing words such as *to broom* although *to sweep* exists in the language. This happens either because (i) the word *to sweep* does not yet exist in the child’s lexicon, or (ii) because the child prefers to form a new verb from a noun he/she uses frequently. Consequently, although children may experience some difficulties with the novel words because of preemption by old words, this need not be so.

A word is also in order about the manipulation of context: while context did bias towards a certain interpretation (literal/figurative), it was not impossible to choose the alternative picture corresponding to the other (non-biased) interpretation either. Thus, even in contexts favouring a figurative interpretation (see **Table 8** and the Appendix available at <https://osf.io/2tk63/>) participants could display a stronger bias for the literal interpretation, failing to make certain natural world knowledge associations, such as the fact that people blush (‘become red like





Context	Example sentences for <i>a cireși</i> ‘to cherry’ with animate subjects	
Literal	Contextual Denominal Task	<i>Fata a cireșit pentru că îi era foame.</i> ‘The girl cherried because she was hungry.’
	Contextual Explicit Denominal Paraphrase Task	<i>Fata a mâncat cireșe pentru că îi era foame.</i> ‘The girl ate cherries because she was hungry.’
	 Literal Picture	 Figurative Picture
Figurative	Contextual Denominal Task	<i>Maria a cireșit când Ion i-a zis că e frumoasă.</i> ‘Mary cherried when John told her she was beautiful.’
	Contextual Explicit Denominal Paraphrase Task	<i>Maria a devenit ca cireșa când Ion i-a zis că e frumoasă.</i> ‘Mary became like a cherry when John told her she was beautiful.’
	 Literal Picture	 Figurative Picture

Table 8: Examples of experimental items with SAD verbs.

cherries’) when told they are beautiful. Participants could also sometimes use an imaginative strategy, treating the picture as the endpoint of an activity that is not explicitly represented. In the literal context for *to cherry*, for instance, they could imagine that the happy girl in the non-target picture has just finished eating the cherries. Consequently, they might pick that picture instead of the picture corresponding to the literal interpretation. While we are aware of these limitations, we preferred to use real pictures instead of drawings to give the experiment a note of real-world authenticity. In addition, schematic drawings, leaving out details present in the real world, have been shown to sometimes lead to errors in acquisition, in contrast to pictures (see Kiss & Zétényi 2017 for insights into the advantages of employing real pictures over drawings when investigating quantifier spreading). Other future experiments could employ videos, where sequences of actions better disambiguate meaning than pictures.

3.2.1.4 Results

3.2.1.4.1 Descriptive results

Romanian adult speakers were sensitive to context, generally providing figurative readings in figurative contexts and literal readings in literal contexts (**Figure 2**). Importantly, in contrast to adults, Romanian children belonging to all age groups were much less context-sensitive, showing an overall preference for literal interpretations even in figurative contexts. For convenience, we shall refer to the correspondence between context and expected answer through the term “accuracy”. However, as well-pointed out by a reviewer, when a participant gives a different answer, that answer is not wrong, but simply not in line with our expectations.

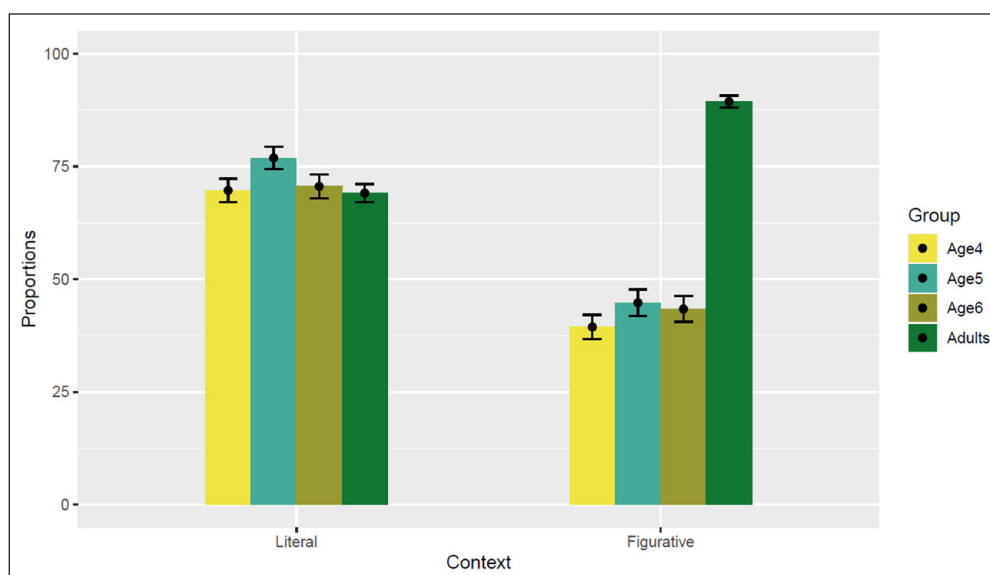


Figure 2: Accuracy (with SE) per Age Group and Context in the Contextual Denominal Task.

Since overall accuracy can be misleading, we need to look carefully at individual participants and individual denominal verbs. We find that adults answered as expected more than 50% of the time for both contexts, whereas only 26 out of 57 children did so, and only 10 handled figurative contexts figuratively. Children also show more variation than the adult group for each individual verb (Figure 3).

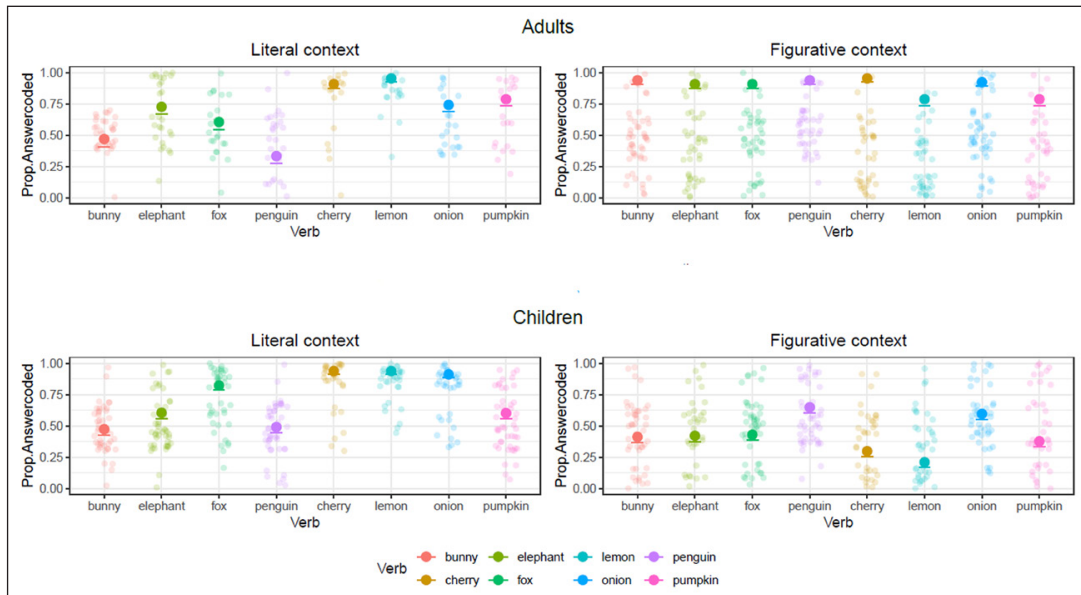


Figure 3: Accuracy proportions per Verb, Age Group, and Context in the Contextual Denominal Task (with individual variation across speakers).

If we look at the root type (animal vs fruit/vegetable), we notice that the lowest accuracy rates for adults were obtained for literal interpretations of denominals derived from animal names (Figure 4). Here, both children and adults seemed to oscillate between literal and figurative answers for denominals. In contrast, in figurative contexts, adults are close to ceiling (92.4%), while children are accurate to an extent of only 47.8%. For denominals derived from fruit/vegetable names, both children and adults are equally accurate in literal contexts (84.8%), but, in figurative contexts, only adults are accurate (86.4%), while children give a high number of literal responses (62.9%). Interestingly, in figurative contexts, children are slightly more accurate with denominals derived from animal roots, which indicates more ease with ‘act like N’ readings than with ‘become like N’ readings.

In terms of Subject Animacy, children seem to be more accurate with animate subjects in figurative contexts but with inanimate subjects in literal contexts, while adults seem to be more accurate with inanimate subjects overall (Figure 5).

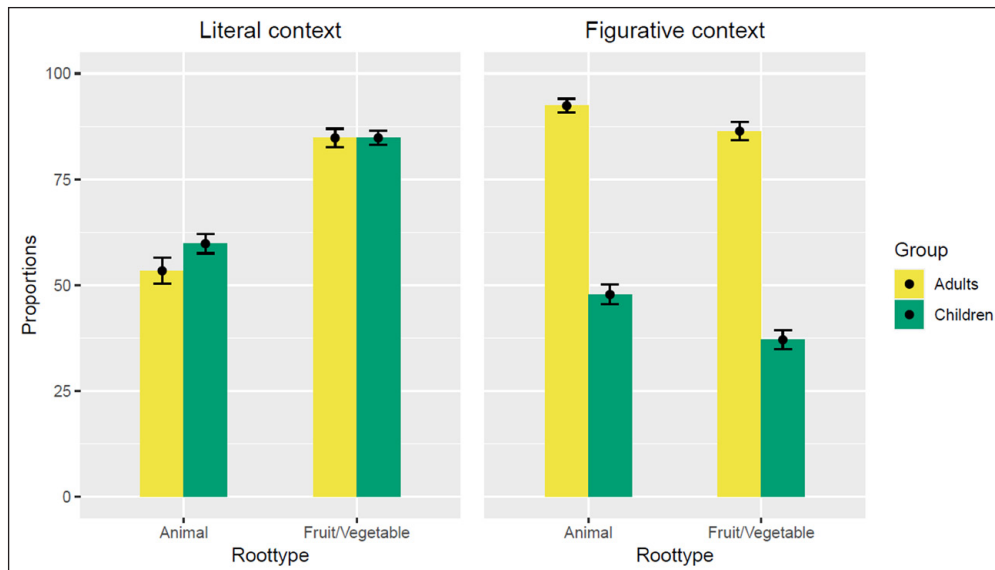


Figure 4: Accuracy (with SE) per Group, Root Type, and Context in the Contextual Denominal Task.

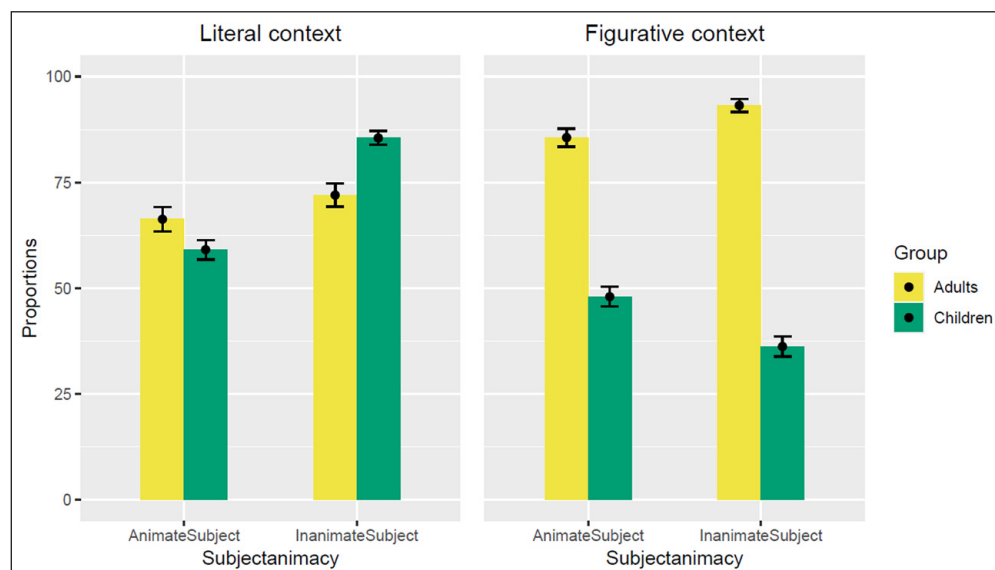


Figure 5: Accuracy (with SE) per Group, Subject Animacy, and Context in the Contextual Denominal Task.

3.2.1.4.2 Statistical analysis

To test whether children performed statistically worse than adults in figurative contexts, we employed the *glmer* function in the statistical package *lme4* in R (R Core Team 2021). The data were fitted into a mixed effect logistic regression model with (expected) Answer as a dependent variable, the fixed effects Context (Literal vs Figurative), Group (Children vs. Adults), and the interaction

between Context and Group, and by-participant slopes per Context and by-verb slopes per Context. The model showed significant effects of Context ($\beta = -1.316$, $SE = 0.57$, $Z = -2.303$, $p < .05$), Group ($\beta = -2.6955$, $SE = 0.206$, $Z = -13.078$, $p < .001$), and the interaction between Context and Group (Context: Group, $\beta = 2.884$, $SE = 0.258$, $Z = 11.153$, $p < .001$).

To see whether there are further differences among 4-, 5- and 6-year-olds, we computed a mixed effect logistic regression model on the child data with (expected) Answer as a dependent variable, the fixed effects Context (Literal vs Figurative), Age (4, 5, 6), and the interaction between Context and Age, and by-participant slopes per Context and by-verb slopes per Context. We found a marginally significant effect of Context ($\beta = 1.89$, $SE = 0.985$, $Z = 1.919$, $p = .055$), but no significant effect of Age or interaction between Context and Age ($p > .05$).

In addition, we tested whether there was an effect of nominal root type upon interpretation, namely, whether children and adults were sensitive to the difference between verbs derived from fruit/vegetable names and animal names. Thus, we fitted the data to a mixed effect logistic regression model with (expected) Answer as a dependent variable, the fixed effects Context (Literal vs Figurative), Group (Children vs. Adults), Entity (Fruit/Vegetable vs Animal) and all the possible interactions between them, and by-participant slopes per Context and Entity and their interaction and by-verb slopes per Context. The model showed significant effects of Context ($\beta = -2.5$, $SE = 0.597$, $Z = -4.19$, $p < .001$), Group ($\beta = -2.749$, $SE = 0.285$, $Z = -9.645$, $p < .001$), the interaction between Context and Group ($\beta = 3.035$, $SE = 0.338$, $Z = 8.972$, $p < .001$), the interaction between Context and Entity ($\beta = 2.423$, $SE = 0.853$, $Z = 2.840$, $p < .001$), but no significant effects of Entity, the interaction between Group and Entity, or the interaction between Context, Group, and Entity.

We also tested the effect of sentence subject animacy upon interpretation. We fitted the data to a mixed effect logistic regression model with (expected) Answer as a dependent variable, the fixed effects Context (Literal vs Figurative), Group (Children vs. Adults), Sentence Subject Animacy (Inanimate vs Animate) and all the possible interactions between them, and by-participant and by-verb slopes per Context, Sentence Subject Animacy, and their interaction and by-verb slopes per Context. The model showed marginally significant effects of Context ($\beta = -1.081$, $SE = 0.62$, $Z = -1.743$, $p = 0.08$), Group ($\beta = -2.083$, $SE = 0.242$, $Z = -8.578$, $p < .001$), Subject Animacy ($\beta = 0.88$, $SE = 0.306$, $Z = 2.882$, $p < .01$), the interaction between Context and Group ($\beta = 1.686$, $SE = 0.319$, $Z = 5.276$, $p < .001$), the interaction between Group and Subject Animacy ($\beta = -1.401$, $SE = 0.3387$, $Z = -4.139$, $p < .001$) and the interaction between Context, Group and Subject Animacy ($\beta = 2.791$, $SE = 0.438$, $Z = 6.364$, $p < .001$).

3.2.1.5 Discussion

Our results show that, while adults are sensitive to context, obeying a *Plausibility in Decompression Principle*, children are much less so, displaying a literal bias in the **Contextual Denominal Task**.

This is in line with similar results from the acquisition of idioms suggesting that children start off with a literal bias (Chaminaud, Laval & Bernicot 2006). Our findings suggest that children do not have a strong sensitivity to linguistic context: when the linguistic context favours a figurative interpretation, they tend to interpret SAD verbs in a literal manner to a quite large extent. Instead, our findings can be explained within the Meaning First Approach if we assume that a principle such as *Simplicity in Decompression* is at work in child language. Given that denominals are indeterminate, ambiguous, and open to many interpretations, children will prefer the simplest interpretation possible. As already argued, the literal interpretation of SAD verbs is simpler from various perspectives. First, literal readings involve DO-type light verbs, activity verbs which are aspectually simpler than the verb BECOME involved in figurative readings, a change of state verb (Levin 1993).⁴ Secondly, literal meanings result from merging verbal meanings with nouns (N) denoting actual entities (e.g., *eat cherries*, *give birth to a bunny*). In contrast, figurative meanings involve a more complex conceptual structure, composing verbal meanings with a LIKE N component (e.g., *become like cherry*, *act like bunny*), expressing a stereotype (Martin & Piñón 2020).

Cognitive accounts can also explain our findings: children's preference for literal over figurative readings may stem from a general difficulty children may have with figurative meanings: such readings are cognitively more costly and less accessible to children (Johnson & Pascual-Leone 1989; Gentner 1988; Nall 1983; a.o.). Figurative meanings require multiple steps: identifying similarities, establishing a relation between them, and then integrating them into a new concept (Recanati 2004; Rubio-Fernández 2007).

Regarding denominals derived from animate roots, both children and adults oscillate between literal and figurative interpretations in literal contexts. However, in figurative contexts, while adults have high accuracy for denominals derived from animate roots, children are below 50%. This can be explained if one assumes an adult preference for an 'ACT like N' interpretation of denominals. This is also in line with the previous results from the **Denominal Sentence and Paraphrase Elicitation Task**, where adults only produced 'act like X' paraphrases for denominals derived from animal names.

Children also generally performed worse than adults with SAD verbs in sentences with animate subjects. This may be because children are now starting to understand that animate subjects can both interact with animals/objects, as well as act like them. Moreover, the findings are in consonance with the previous results from the **Denominal Sentence and Paraphrase Elicitation Task**.

Interestingly, children of all ages seem to show a similar literal bias in interpreting SAD verbs in context, which suggests that the literal bias characterizes at least the period between ages 4 and 6.

⁴ It is not clear, however, whether DO is simpler than ACT. Such a claim could be made if we assume ACT involves an obligatory manner component, whereas DO does not.

The Contextual Denominal Task offers important insights into children’s understanding of SAD verbs. Importantly, we find that children are not as sensitive to context as adults. However, we do not know whether children’s non-adult-like performance with figurative meanings is due to a difficulty with the decompression of figurative meaning or a difficulty with figurative meaning in general. In other words, it might be that children have difficulties with the figurative interpretation of *a cireși* ‘to cherry’ simply because the ‘become like a cherry’ reading is not accessible to them. *To cherry* allows many interpretations, and children prefer to interpret it in the simplest way possible (i.e., literally). On the other hand, it might also be that children do actually access the underlying conceptual structure ‘become like a cherry’, but they have difficulty interpreting it. To pin down the source of children’s difficulties with SAD verbs, we further investigate whether children are more accurate in response to context when the underlying internal structure of denominals is made explicit through paraphrases, i.e., **when instead of being exposed to denominal verbs, they are exposed to the corresponding denominal verb paraphrases.**

3.2.2 Contextual Explicit Denominal Paraphrase Task

In another experiment, the **Contextual Explicit Denominal Paraphrase Task**, we expose Romanian children and adults to explicit paraphrases of denominal verbs in literal- or figurative-biased contexts. We specifically investigate if children find it easier to access figurative readings in figurative contexts when the internal structure of SAD verbs is explicitly spelled out (e.g., *to become like a cherry* instead of *to cherry*, *to act like a fox* instead of *to fox*).

Previous research on light verbs in child language shows conflicting evidence: some studies show that children prefer using single non-light verbs (e.g., “A kissed B”) over paraphrases with (light) verbs (e.g., “A gave B a kiss”) (Barner 2001; Goldberg 2013; Oshima-Takane et al. 2001; He & Wittenberg 2020), while others argue that children (with and without SLI) tend to overuse light verb constructions (Kambanaros & Grohmann 2013). Paraphrases have more arguments than semantic roles (Wittenberg 2018; He & Wittenberg 2020), but they have the advantage of semantic transparency. Thus, we might expect children to understand paraphrases of SAD verbs better than SAD verbs, given that they make the underlying meaning more explicit.

3.2.2.1 Predictions

If Romanian children cannot interpret paraphrases such as ‘to become like a cherry’ or ‘to act like a fox’ in an adult-like manner, then they are cognitively unable to process figurative meanings altogether. If, however, Romanian children handle figurative denominal paraphrases in an adult-like manner, children’s apparent lack of context-sensitivity in the **Explicit Denominal Task** can be explained in two ways (which are not necessarily mutually exclusive): through a *Simplicity in Decompression* Principle, which makes children favour literal interpretations over figurative ones

on grounds of (structural and conceptual) simplicity, or through cognitive difficulty with implicit figurative meanings.

3.2.2.2 Participants

57 Romanian monolingual typically-developing children (Age range: 4–6) and 42 Romanian adult native speakers took part in the experiment. The children represented 3 different age groups: (i) 20 4-year-olds (12 Male, 8 Female, Age range: 4–4;11, Mean age: 4;43), (ii) 20 5-year-olds (8 Male, 12 Female, Age range: 5–5;11, Mean age: 5;09), and (iii) 17 6-year-olds (6 Male, 11 Female, Age range: 6–6;7, Mean age: 6;1). The adult controls were undergraduate students at the University of Bucharest and received course credit for participation. Participants were different from the groups in the previous experiments in order to avoid a possible priming effect.

3.2.2.3 Procedure & materials

The procedure was identical to the **Contextual Denominal Task**. The materials made the inner structure composing denominal meaning explicit. Sentences creating a literal bias made the verb explicit (*to eat cherries, to give birth to a bunny*), while sentences creating a figurative bias used a verb and a LIKE + noun continuation (*to become like a cherry, to act like a bunny*)-see **Table 8**. We opted for using light verbs for paraphrases of figurative denominal verbs, but light verbs/lexical verbs for paraphrases of literal denominal verbs based on the answers provided by children and adults in the **Denominal Sentence and Paraphrase Elicitation Task**, aiming to make the sentences with the paraphrases sound as natural as possible.

3.2.2.4 Results

3.2.2.4.1 Descriptive results

Both Romanian children and adults were sensitive to context, generally responding with figurative readings in figurative contexts and literal readings in literal contexts (**Figure 6**). Children of all ages were overall less context-sensitive than adults, but 5- and 6-year-olds gave slightly more adult-like answers than 4-year-olds.

Importantly, unlike in the **Contextual Denominal Task**, both children and adults gave answers as expected for all SAD verbs at a very high rate (>60%), except for the literal interpretation of *a pinguini* ‘to penguin’ and the figurative interpretation of *a lămâi* ‘to lemon’, where there was more variation in their responses (**Figure 7**). This may be because of an interfering ‘act (walk) like a penguin’ bias and the difficulty of the ‘become (sour) like a lemon’ reading associated with *a lămâi* ‘to lemon’.

With respect to root type, both groups varied their interpretation with context for both denominals derived from fruit/vegetable names and from animal names (**Figure 8**). In the literal context, both children and adults were more accurate for figurative interpretations of denominals

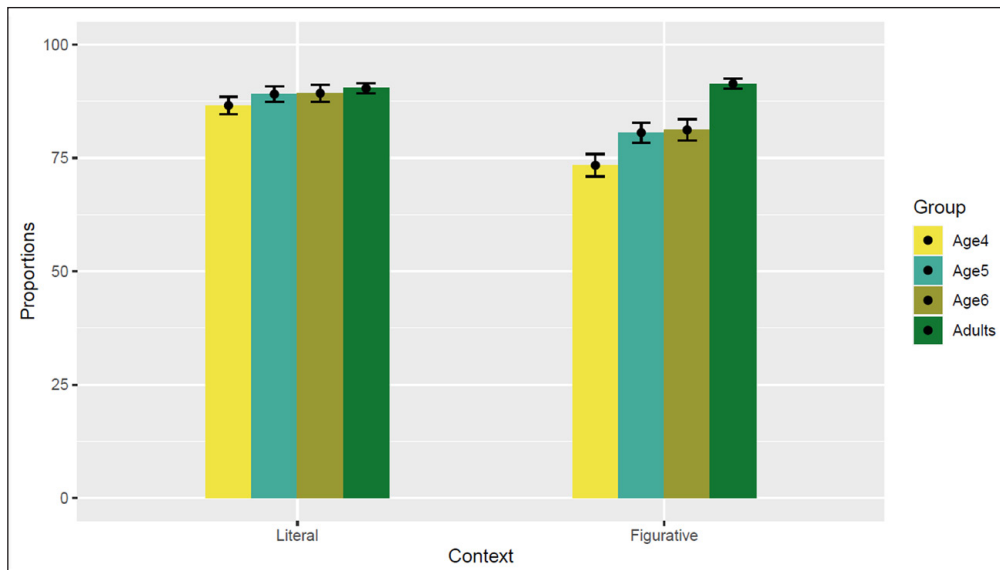


Figure 6: Accuracy (with SE) per Age Group, and Context in the Contextual Explicit Denominal Paraphrase Task.

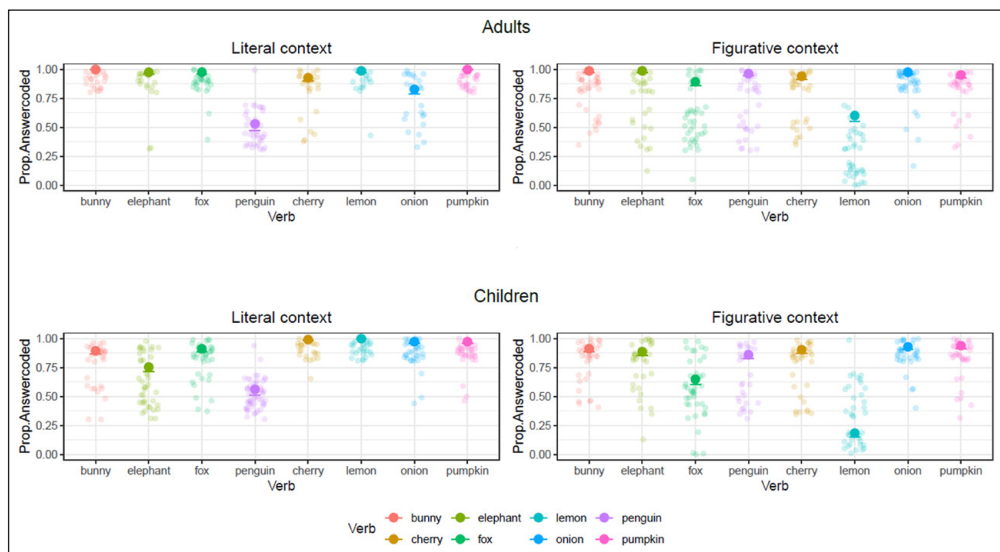


Figure 7: Accuracy proportions per Verb, Age Group, and Context in the Contextual Explicit Denominal Task (with individual variation across speakers).

derived from fruit/vegetable names (children: 98.5%, adults: 93.7%). In the figurative contexts, both adults and children were more accurate with SAD verbs derived from animal names (children: 82.7%, adults: 95.8%), which indicates that the ‘act like N’ reading is slightly easier to handle than the ‘become like N’ reading.

In terms of subject animacy, children seem to perform slightly worse than adults with animate subjects (see **Figure 9**).

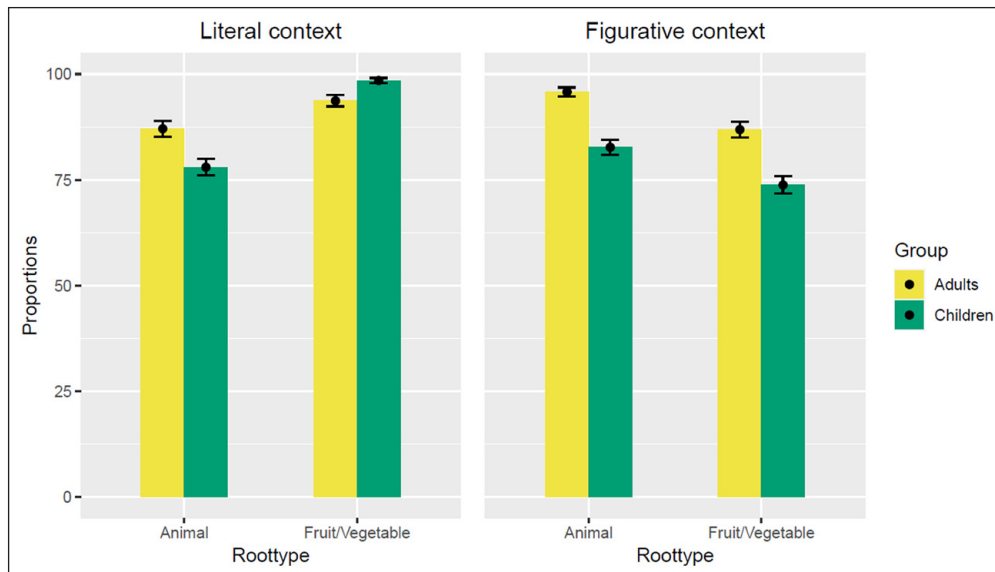


Figure 8: Accuracy (with SE) per Group, Context and Root Animacy in the Contextual Explicit Denominal Paraphrase Task.

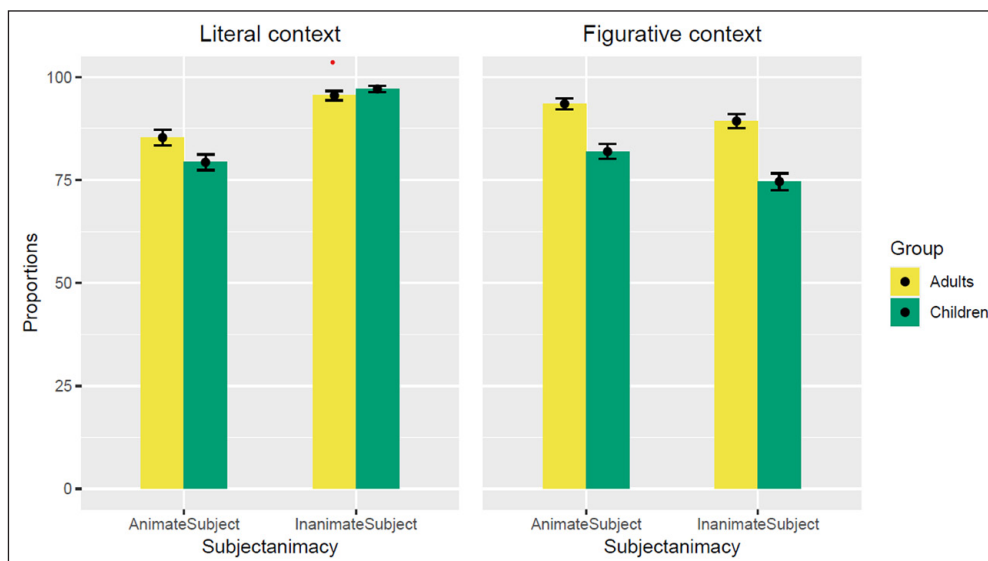


Figure 9: Accuracy (with SE) per Group, Context and Subject Animacy in the Contextual Explicit Denominal Paraphrase Task.

3.2.2.4.2 Statistical analysis

To test whether children performed statistically worse than adults in figurative contexts, we employed a mixed effect logistic regression model with (expected) Answer as a dependent variable, the fixed effects Context (Literal vs Figurative), Group (Children vs. Adults), and the interaction between Context and Group, and by-participant slopes per Context and by-verb slopes per Context. The model showed significant effects of Group ($\beta = -1.55$, $SE = 0.22$, $Z = -6.99$,

$p < .001$) and significant interaction between Context and Group (Context: Group, $\beta = 1.278$, $SE = 0.28$, $Z = 4.554$, $p < .001$), but no significant effect of Context ($p = 0.784$).

We also investigated further differences between 4-, 5- and 6-year-olds. We fitted the data from children's responses into a mixed effect logistic regression model with (expected) Answer as a dependent variable, the fixed effects Context (Literal vs Figurative) and the interaction between Context and Group and by-participant slopes per Context and by-verb slopes per Context. The model shows significant effects per Age ($\beta = 0.3636$, $SE = 0.1326$, $Z = 2.741$, $p < .001$). We then computed multiple pairwise t-tests to calculate pairwise comparisons between groups with corrections for multiple comparisons. The results reveal significant differences between 4- and 5-year-olds ($p = 0.03$), and between 4- and 6-year-olds ($p = 0.03$), but not between 5- and 6-year-olds ($p = 0.84$).

We also tested the effect of the type of denominal used upon interpretation, namely, whether children and adults were sensitive to the difference between verbs derived from fruit/vegetable names and from animal names. Thus, we fitted the data to a mixed effect logistic regression model with (accurate) Answer as a dependent variable, the fixed effects Context (Literal vs Figurative), Group (Children vs. Adults), Entity (Fruit/Vegetable vs Animal) and all the possible interactions between them, and by-participant slopes per Context and Entity and their interaction and by-verb slopes per Context. The model revealed significant effects of Group ($\beta = -1.733$, $SE = 0.342$, $Z = -5.063$, $p < .001$), interaction between Context and Group ($\beta = 0.967$, $SE = 0.404$, $Z = 2.395$, $p < .05$), and interaction between Context, Group and Entity ($\beta = 2.05$, $SE = 0.704$, $Z = 2.914$, $p < .01$)

In addition, we tested the effect of sentence subject animacy upon interpretation. We fitted the data to a mixed effect logistic regression model with (accurate) Answer as a dependent variable, the fixed effects Context (Literal vs Figurative), Group (Children vs. Adults), Sentence Subject Animacy (Inanimate vs Animate) and all the possible interactions between them, and by-participant and by-verb slopes per Context, Sentence Subject Animacy, and their interaction and by-verb slopes per Context. The model showed significant effects of Group ($\beta = -1.674$, $SE = 0.347$, $Z = -4.827$, $p < .001$), Subject Animacy ($\beta = -0.869$, $SE = 0.354$, $Z = -2.452$, $p < .05$), the interaction between Context and Group ($\beta = 1.072$, $SE = 0.410$, $Z = 2.613$, $p < .01$), the interaction between Context and Subject Animacy ($\beta = 4.289$, $SE = 1.523$, $Z = 2.815$, $p < .01$), but not for the interaction between Group and Subject Animacy ($p > .05$) or the interaction between Context, Group and Subject Animacy ($p > .05$).

To compare children's performance in the **Contextual Denominal Task** versus the **Contextual Explicit Denominal Paraphrase Task**, we fitted the data to a mixed effect logistic regression model with (accurate) Answer as a dependent variable, the fixed effects Context (Literal vs Figurative), Group (Children vs. Adults), Task (Denominal vs Explicit Denominal Paraphrase), and all the possible interactions, and by-participant slopes per Context and by-verb slopes per Context. The model showed significant effects of Context ($\beta = -1.327$, $SE = 0.565$, $Z = -2.348$, $p =$

0.018 < .05), Group ($\beta = -2.699$, SE = 0.204, Z = -13.237, $p < .01$), the interaction between Context and Group (Context: Group, $\beta = 2.882$, SE = 0.244, Z = 11.802, $p < .01$), the interaction between Group and Task ($\beta = 1.145$, SE = 0.298, Z = 3.844, $p < .01$), the interaction between Context, Group and Task ($\beta = -1.602$, SE = 0.376, Z = -4.257, $p < .01$), and marginally significant effects of Task ($\beta = 0.847$, SE = 0.445, Z = 1.904, $p = .056 > .05$), and the interaction between Context and Task ($\beta = 1.145$, SE = 0.298, Z = 3.844, $p = .053 < .01$).

3.2.2.5 Discussion

The results of the **Contextual Explicit Denominal Paraphrase Task** suggest that both children and adults can handle figurative readings in figurative-biasing contexts. Moreover, both groups seem context-sensitive, choosing more literal pictures for literal contexts and figurative pictures for figurative contexts. Thus, children can handle figurative meanings when these are spelled out explicitly through ‘become like N’/‘act like N’ paraphrases, i.e., through a light verb and a *like N* component. Interestingly, there is a developmental effect for comprehending ‘act/become like N’ paraphrases, given that 4-year-olds perform slightly worse than 5- and 6-year-olds. Our results are compatible with the *Compressed Meaning is Hard* hypothesis we proposed within the Meaning First Approach, as well as with cognitive theories which argue that explicit figurative meaning is not equivalent to implicit figurative meaning (see Section 2.4.2).

Interestingly, we also see that overall, both children and adults perform better with explicit paraphrases than with denominals. This happens in literal contexts as well, which is not predicted by the cognitive accounts we discussed, but only by the Meaning First Approach.

In literal contexts, we also find that children’s and adults’ performance is better with verbs derived from inanimate roots than animate ones, and better with inanimate subjects than with animate subjects, while, in figurative contexts, children and adults’ performance is better with verbs derived from animate roots than inanimate ones and better with animate subjects than inanimate ones. ‘Act like N’ readings are thus more accessible than ‘become like N’ readings. The findings seem to reflect the intuition that vegetables/fruits are defined by actions that involve them (e.g., *picking cherries*), but animals are characterized more through their behaviour (e.g., *acting like a fox*, i.e., stealing). The noted difference may also have to do with the fact that we easily associate stereotypical properties to animates, while the ones associated with inanimates are more culture-dependent, as pointed out by an anonymous reviewer.

4 General discussion

The **Contextual Denominal Task** and the **Contextual Explicit Denominal Paraphrase Task** provide insights into how Romanian children and adults understand novel denominal verbs. We find that compressed meaning (or opaque meaning in Slobin (1973)’s terminology) is generally hard for children and that children fare much better when the meaning is made explicit.

The **Contextual Denominal Task** shows us that, unlike adults, who are generally more context-sensitive, children have a strong literal bias in interpretation. Interestingly, there seems to be a difference between denominal verbs derived from inanimate roots versus animate roots. Children interpret SAD verbs derived from animal names either literally or figuratively, though there seems to be a literal bias overall.⁵ However, adults seem to have a strong association between animal class SAD verbs and ‘act like N’ interpretations, which show up even in literal contexts. This confirms the findings in the **Elicited Denominal Paraphrase and Sentence Task**, where adults almost exclusively produced ‘act like N’ paraphrases for denominals derived from animal names.

Children’s failure to show context-sensitivity in the interpretation of SAD verbs could be a consequence of their difficulty to access the underlying conceptual structure of SAD verbs, given their compressed nature. If we assume a Meaning First Approach, then children differ from adults, who abide by a *Plausibility in Decompression Principle*. Instead, children observe *Simplicity in Decompression*, going for the simplest interpretation available to them. Additionally, world knowledge could also make such mappings more accessible to children than more complex mappings which involve computing similarities among entities. On the other hand, children’s difficulty in interpreting *to cherry* figuratively could stem from more general cognitive difficulties with figurative meanings (Johnson & Pascual-Leone 1989; Gentner 1988; Nall 1983; a.o.), i.e., children might fail to interpret even ‘become like a cherry’ in a figurative manner.

The **Contextual Explicit Denominal Paraphrase Task** further tries to pin down the source of this failure with denominals, investigating whether children perform more accurately with figurative contexts if the underlying meaning of denominals is made explicit through ‘become like N’/‘act like N’ paraphrases. The results show that children can follow the semantics overtly expressed by paraphrases, performing more adult-like in this task. Moreover, adults’ performance is accurate both with inanimate and animate root SAD verbs, and, importantly, it is also more accurate than in the **Contextual Denominal Task**. While, in the **Contextual Denominal Task**, participants can only rely on linguistic context and world knowledge, in the **Contextual Explicit Denominal Paraphrase Task**, participants can additionally rely on paraphrases, containing lexical cues to the intended meaning.

Interestingly, while children of ages 4, 5, and 6 perform alike with denominal verbs, showing a general literal bias, younger children (4-year-olds) perform worse with denominal paraphrases

⁵ While the results may be interpreted as indicating that children were at chance, as indicated by a reviewer, they often gave various motivations for their answers. This, to our mind, reveals that there was some thought process behind their answers. For instance, one child told me that *to fox* means ‘to cut foxes into pieces and eat their meat’, ‘to elephant’ means ‘to cut elephants into pieces and eat their meat’ etc. He said “this is what people do to animals”. Other children gave different motivations: some animals made them think of stories where the fox was tricking someone.

than older children (5- and 6-year-olds). The difficulty in comprehending SAD verbs may thus carry over from early childhood to a later stage in development. In fact, even adults' answers in the **Contextual Denominal Task** are not at ceiling, possibly because of other biases (such as the figurative bias for animal class denominals, for instance).

Taken together, our experiments show that **explicit meaning is easier to handle by children than implicit meaning**, which is in line with Meaning First Approach (Sauerland & Alexiadou 2020) and the idea that *Compressed Meaning is Hard*. Previously, it has been argued that children have an acquisition bias towards transparent one-to-one mappings between concepts and forms (see Slobin 1973; van Hout 1998). Interestingly, compressed meaning is more challenging than explicit meaning even in literal contexts, but the difficulty seems even greater in figurative contexts. Our finding that **explicit figurative meaning is easier to handle by children than implicit figurative meaning** is incompatible with cognitive accounts which assume the equivalence between metaphors and similes (see Section 2.4), but it is compatible with a generative Meaning First Approach (Sauerland & Alexiadou 2020), according to which children decompress the indeterminate, ambiguous meaning of denominals to the simplest interpretation possible, involving a one-to-one mapping (literal interpretation). It is also compatible with cognitive accounts which assume that explicit figurative meaning is not equivalent to implicit figurative meaning. Although our experiments do not distinguish between these two types of accounts, ultimately, the two accounts may not be that incompatible. While generative and cognitive linguistics have been claimed to be at odds with each other (Lakoff 1991), relying on different assumptions (the innateness and autonomy of syntax vs learning language) and having a different focus (formal syntax vs usage, social function), bridges can be built between the two types of linguistics, as argued by Newmeyer (2011), given that interpretation may involve both structure computation and cognitive processes. Thus, it may be that the implicit denominal and explicit denominal paraphrases are characterized by both structural and cognitive differences. Importantly, we take the fact that children produce denominal paraphrases consisting of verbs and nouns in the **Denominal Sentence and Paraphrase Elicitation Task** in Bleotu (2021) as a possible indication that children treat denominals as compressed forms, decomposing them into various meaning components. We thus embrace a Meaning First Approach. However, we do not exclude the possibility that there may be cognitive reflexes of generative meaning, and, in fact, assuming such a reflex may provide a more comprehensive perspective on the relationship between structure and cognition. Importantly, while the findings about participants' interpretations in figurative contexts can be accounted for both within the Meaning First Approach and cognitive accounts which capitalize on the difference between metaphors and similes, participants' higher accuracy with explicit paraphrases in literal contexts is predicted by the Meaning First Approach exclusively.

Within the Meaning First Approach, we tentatively propose that the lexicon initially contains multiple meaning structures for denominals (corresponding to both literal and figurative

readings). These structures compete but, at an early stage in acquisition, children prefer literal interpretations over figurative ones (**Table 9**). Literal readings are less compressed than figurative readings. They involve a simpler underlying event structure merging DO-type verbs with Nouns, while figurative readings involve merging BECOME/ACT verbs with an N-like component. We assume this latter component is represented by a “LIKE N” structure in the style of Hale & Keyser (2002). An alternative would be to assume it is instead a Root, as in Kiparsky’s (1997) framework. However, postulating a “LIKE N” structure in the representation of figurative denominals can explain the contrast between implicit and explicit structures better: if we assume explicit structures spell out underlying conceptual structures (such as underlying verbs and the underlying LIKE component), then it is only natural they should have more ease interpreting them in comparison to implicit structures. DO-*ing* verbs are typical event verbs in child language, and nouns represent lexical categories familiar to children from very early on (Echols & Marti 2004; Fennell 2006; Waxman & Booth 2001, a.o.). At an early stage in acquisition, children generally observe *Simplicity in Decompression*: they prefer aspectually simpler DO-type meanings. Moreover, they prefer to interpret nouns literally, avoiding N-like meanings which may be more challenging, involving identifying possible similarities between objects. Children start by merging DO-type verbs and Nouns together, and, on the basis of world knowledge, in line with *Plausibility in Decompression*, they decide that, for certain verbs, a more natural (world-adequate) or context-adequate interpretation would be to merge BECOME/ACT verbs with components

<i>to cherry</i>	
LITERAL (true)	FIGURATIVE (pseudo)
<pre> V / \ V N DO cherry </pre> <p>(to eat, pick, a.o.)</p>	<pre> V / \ V LIKE N BECOME cherry (COME TO BE) (Meaning: cherry-like) </pre> <p>(to blush, turn red, a.o.)</p>
<i>to fox</i>	
LITERAL (true)	FIGURATIVE (pseudo)
<pre> V / \ V N DO fox </pre> <p>(to catch, tame, a.o.)</p>	<pre> V / \ V LIKE N ACT fox (Meaning: fox-like) </pre> <p>(to steal, lie, trick, a.o.)</p>

Table 9: Competing meanings of novel denominal verbs.

with LIKE N meanings. The fact that children tend to interpret verbs derived from animal names figuratively to a high degree even in literal contexts may be taken to suggest children already observe *Plausibility in Decompression* to a certain extent. The effect of subject animacy suggests a similar conclusion, given that, in the case of children, inanimate subjects lead to a higher rate of expected answers than animate subjects in literal contexts, and animate subjects lead to a higher rate of expected answers than inanimate subjects in figurative contexts.

Regarding sensitivity to context, children are, however, less sensitive to context than adults. In figurative contexts, unlike adults, children seem to have an overall literal interpretation preference until quite late, even in figurative-biasing linguistic contexts. This preference is, however, less pronounced with nouns derived from animal names: children seem to handle ‘act like N’ readings more easily than ‘become like N’. This important finding is also in line with *Simplicity in Decompression*, given that ‘act like N’ activity verbs can be argued to be aspectually simpler than change of state verbs (Levin 1993): if *become N* is decomposed as ‘come to be N’, then change of state verbs involve more material to compress than ‘act like N’.

Importantly, (partly) spelling out the meaning of denominals through verbs and the explicit marker “like (N)” leads to higher accuracy both for children and adults, showing that explicitness eases understanding. While we have primarily explained our results about figurative meanings in terms of the Meaning First Approach, our findings are also compatible with cognitive accounts which argue that metaphors and similes are not equivalent (Glucksberg & Keysar 1990; Chiappe & Kennedy 2001; Glucksberg & Haught 2006; Roncero, Kennedy & Smyth 2006; Carston 2002; Sperber & Wilson 2008; Glucksberg 2011; Roncero, de Almeida, Martin, & de Caro 2016; a.o.) Thus, while *become like a cherry* would suggest a change of state with respect to a property or several properties shared by the subject and cherries (the color red, for instance), the figurative *be a cherry* or *cherry* would count as a metaphorical categorization statement, where the subject is included into a novel abstract concept or among the category of people who are involved in ‘cherry’ activities or processes in an abstract sense (Glucksberg & Keysar 1990; Glucksberg & Haught 2006; Sperber & Wilson 2008). Moreover, saying *X cherries* in a figurative sense would be stronger than saying that *X becomes like a cherry* (Roncero et al. 2006), with the first statement expressing identity, and the second expressing near identity in similarity. We believe that the Meaning First Approach and a cognitive account treating explicit figurative meanings (similes) as distinct from implicit figurative meanings (metaphors) need not be mutually exclusive. In other words, it may be that participants compute figurative denominal meanings both structurally (decompressing the underlying meaning of denominals) and cognitively (figuring out in which sense X becomes or acts like N). Importantly though, only the Meaning First Approach predicts more difficulty with implicit meanings than with explicit meanings even in literal contexts, which is what we find. This leads us to the conclusion that our results are best captured overall by the Meaning First Approach.

Finally, we would like to point out that, while we believe our findings are easily accounted for within the Meaning First Approach, we do not wish to claim that other factors such as exposure or frequency do not play any role whatsoever. However, we do not believe such factors can fully explain our data. First and foremost, children have no exposure to the SAD verbs we tested here, and yet they provide interpretations for them. Secondly, while usage-based approaches, which assume that children learn to produce and interpret various words/structures through generalizations from the input (Tomasello 2000; 2003; Goldberg 2006), can also capture the finding that children do better with explicit structures than with semi-nonce verbs involving implicit structures, they cannot necessarily account for why children decompress in the manner they do. One would need to additionally assume that decompression favours uses that are more frequent in the input. Furthermore, it is not clear what the corpus language facts are; one would need to investigate whether the availability of literal/figurative meanings for denominal verbs in child Romanian varies with the frequency in child-directed input of the corresponding nominal roots/light verbs/denominal paraphrases. However, the scarcity of corpus data for child Romanian (there is data only for three children) makes this task very challenging. Consequently, a discussion of our acquisition findings in terms of usage would lack a solid frequency-informed basis. Such an undertaking would only be possible for adult Romanian. Nevertheless, this would represent an extensive investigation, for which reason we leave it as a potential direction for future research.

5 Conclusion

In conclusion, in the current paper, we have probed into the acquisition of the meaning of denominal verbs through a SAD paradigm that relies on non-existent denominal verbs derived from familiar nouns. Such a paradigm helps us obtain a clearer picture of how children and adults derive meaning below word level in the absence of any lexical bias related to already-existent verbs. We conducted two experiments (a **Contextual Denominal Task** and a **Contextual Denominal Paraphrase Task**), where native Romanian children and adults had to choose matching pictures for sentences with novel denominals/denominal paraphrases used in literal-biasing or figurative-biasing contexts. Our findings show that children start off with a literal bias, preferring simpler interpretations that merge DO-type verbs with nouns denoting the actual entities, while adults are more context-sensitive, though, in their case too, a figurative bias seems to be at work for verbs derived from animal names. The main challenge in understanding novel denominals (both for children and adults) seems to be getting to the underlying meaning of these verbs. Denominals are an interesting case of compression of meaning: they are ambiguous, indeterminate, open to a variety of interpretations, and pinning down their interpretation is not an easy task, given that both structural and conceptual simplicity, as well as plausibility seem to play an important role. Overall, children's greater ease with explicit meanings in comparison to implicit meanings and their decompression preferences can best be explained within the Meaning First Approach.

Data availability

The Appendix, data and code associated with the paper are available at: <https://osf.io/2tk63>.

Ethics and consent

The study has been conducted under approval of the Research Ethics Committee in Bucharest (17/17.02.2022), and consent has been obtained from all participants (adults, children, and their legal custodians).

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Competing interests

The author has no competing interests to declare.

References

- Ambridge, Ben & Ambridge, Chloe. 2020. The retreat from transitive-causative overgeneralization errors: A review and diary study. In Rowland, Caroline F. & Theakston, Anna L. & Ambridge, Ben & Twomey, Katherine E. (eds.), *Current Perspectives on Child Language Acquisition*, 113–130. John Benjamins Publishing Company. DOI: <https://doi.org/10.1075/tilar.27.05amb>
- Arnold, Jennifer E. 2010. How speakers refer: the role of accessibility. *Language and Linguistic Compass* 4. 187–203. DOI: <https://doi.org/10.1111/j.1749-818X.2010.00193.x>
- Aronoff, Mark. 1980. Contextuals. *Language* 56(4). 744–58. DOI: <https://doi.org/10.2307/413486>
- Ashby, Jane & Roncero, Carlos & de Almeida, Roberto G. & Agauas, Stephen J. 2017. The early processing of metaphors and similes: Evidence from eye movements. *Quarterly Journal of Experimental Psychology* 31. 1–9. DOI: <https://doi.org/10.1080/17470218.2016.1278456>

- Barner, David. 2001. Light verbs and the flexible use of words in early language learning. Master's thesis: McGill University.
- Berman, Ruth. 2000. Children's innovative verbs versus nouns: Structured elicitations and spontaneous coinages. In Menn, Lisa & Berstein-Ratner, Nan (eds.), *Methods in studying language production*, 69–93. Mahwah, NJ: Lawrence Erlbaum.
- Bhatt, Rajesh & Pancheva, Roumyana. 2017. Implicit arguments. In Everaert, Martin & van Riemsdijk, Henk C. (eds.), *The Wiley Blackwell Companion to Syntax, Second Edition*. John Wiley & Sons. DOI: <https://doi.org/10.1002/9781118358733.wbsyncom118>
- Billow, Richard M. 1975. A cognitive developmental study of metaphor comprehension. *Developmental Psychology* 11. 415–423. DOI: <https://doi.org/10.1037/h0076668>
- Bleotu, Adina Camelia. 2012. Why does IT always rain on me? On weather verbs. In Balázs Surányi, Balázs & Varga, Diána (eds.), *Proceedings of the First Central European Conference in Linguistics for Postgraduate Students*, 59–82.
- Bleotu, Adina Camelia. 2013. There is a light (verb) that sometimes goes out in weather verbs. In Windhaber, Irina & Anreiter, Peter (eds.), *Proceedings of the 4th Austrian Students' Conference of Linguistics*, 47–64. Cambridge Scholars Publishing.
- Bleotu, Adina Camelia. 2016a. A Phrasal Spell-Out account of denominal verbs in English and Romanian. In Bellamy, Kate & Karvovskaya, Elena & Kohlberger, Martin & Saad, George (eds.), *ConSOLE XXIII: Proceedings of the 23rd Conference of the Student Organization of Linguistics in Europe (7–9 January 2015, Paris)*, 175–199. Leiden: Leiden University.
- Bleotu, Adina Camelia. 2016b. A Spanning account of denominal verbs in English and Romanian. In Cinque, Guglielmo & Rizzi, Luigi (eds.), *Rivista di Grammatica Generativa*, vol. 38, 13–23. Venezia. Available online: <http://lear.unive.it/jspui/handle/11707/5689>.
- Bleotu, Adina Camelia. 2017. What does *a cireși* 'to cherry' mean? Revisiting Kiparsky's (1997) Canonical Use Principle from an experimental and theoretical standpoint. Available at: lingbuzz/00374.
- Bleotu, Adina Camelia. 2019. *Towards a Theory of Denominals: A Look at Incorporation, Phrasal Spell-Out and Spanning*. Leiden: Brill. DOI: <https://doi.org/10.1163/9789004409514>
- Bleotu, Adina Camelia. 2021. Denominal verbs and creativity in child Romanian. *Bucharest Working Papers in Linguistics* 23(2). 33–49. Available at: <https://bwpl.unibuc.ro/vol-xxiii-nr-2/>. DOI: <https://doi.org/10.31178/BWPL.23.2.2>
- Bleotu, Adina Camelia. 2022. Experimental insights into denominals and creativity in adult Romanian. *Studii de lingvistică* 12(2). 17–40.
- Bleotu, Adina Camelia & Ivan, Rodica. 2022. Voice alternation in SE figure reflexives in Romanian: Evidence from a semi-artificial paradigm. In Alboiu, Gabriela & Isac, Dana & Nicolae, Alexandru & Tănase-Dogaru, Mihaela & Tigău, Alina. *A Life in Linguistics: A Festschrift for Alexandra Cornilescu on her 75th Birthday*, 79–101. București: Editura Universității București.
- Bleotu, Adina Camelia & Ivan, Rodica. 2023. SE figure reflexives alternate with Voice in Romanian: Insights from a semi-artificial denominal paradigm. In *Proceedings of the 58th Chicago Linguistic Society*.

- Bleotu, Adina Camelia & Bloem, Jelke. 2020. The distinction between true and pseudo denominals? It's an illusion! In Asatryan, Mariam & Song, Yixiao & Whitmal, Ayana (eds.), *NELS 50: Proceedings of the Fiftieth Annual Meeting of the North East Linguistic Society* (Vol. 1), 39–48. Amherst: Graduate Linguistics Student Association, Department of Linguistics, University of Massachusetts.
- Bleotu, Adina Camelia & Bloem, Jelke. 2021. What's the meaning of a nominal root? Insights from experiments into denominals and similarity. In *Proceedings of the 39th West Coast Conference on Formal Linguistics*. Available at: <https://ling.auf.net/lingbuzz/006091>.
- Blix, Hagen. 2021. Spans in South Caucasian agreement. *Natural Language and Linguistic Theory* 39. 1–55. DOI: <https://doi.org/10.1007/s11049-020-09475-x>
- Bock, J. Kathryn & Warren, Richard K. 1985. Conceptual accessibility and syntactic structure in sentence formulation. *Cognition* 21(1). 47–67. DOI: [https://doi.org/10.1016/0010-0277\(85\)90023-X](https://doi.org/10.1016/0010-0277(85)90023-X)
- Borer, Hagit. 2014. The category of roots. In Alexiadou, Artemis & Borer, Hagit & Schäfer, Florian (eds.), *The Roots of Syntax, the Syntax of Roots*, 91–121. Oxford: Oxford University Press. DOI: <https://doi.org/10.1093/acprof:oso/9780199665266.003.0006>
- Bowerman, Melissa. 1982a. Reorganizational processes in lexical and syntactic development. *Language acquisition: The State of the Art*, 319–346. Cambridge, UK: Cambridge University Press.
- Bowerman, Melissa. 1982b. Evaluating competing linguistic models with language acquisition data: implications of developmental errors with causative verbs. *Quaderni di Semantica* 3. 5–66.
- Branigan, Holly P. & Feleki, Eleonora. 1999. Conceptual accessibility and serial order in Greek speech production. In *Proceedings of the Twenty First Annual Conference of the Cognitive Science Society*. Vancouver: Psychology Press.
- Branigan, Holly P. & Pickering, Martin J. & Tanaka, Mikihiro. 2008. Contributions of animacy to grammatical function assignment and word order during production. *Lingua* 118. 172–189. DOI: <https://doi.org/10.1016/j.lingua.2007.02.003>
- Brody, Michael. 2000. Mirror theory: Syntactic representation in perfect syntax. *Linguistic Inquiry* 31(1). 29–56. DOI: <https://doi.org/10.1162/002438900554280>
- Brooks, Patricia J. & Tomasello, Michael & Dodson, K. & Lewis, Lawrence B. 1999. Young children's overgeneralizations with fixed transitivity verbs. *Child Development* 70(6). 1325–1337. DOI: <https://doi.org/10.1111/1467-8624.00097>
- Bushnell, Emily W. & Maratsos, Michael P. 1984. Spooning and basketing: Children's dealing with accidental gaps in the lexicon. *Child Development* 55(3). 893–890. DOI: <https://doi.org/10.2307/1130140>
- Cameron, Lynne. 1996. Discourse context and the development of metaphor in children. *Current Issues in Language & Society* 3(1). 49–64. DOI: <https://doi.org/10.1080/13520529609615452>
- Cameron, Lynne. 2003. *Metaphor in Educational Discourse*. London: Continuum.
- Carston, Robyn. 2002. Metaphor, ad hoc concepts and word meaning—more questions than answers. *University College London Working Papers in Linguistics* 14. 83–105.

- Chaminaud, Stéphanie & Laval, Virginie & Bernicot, Josie. 2006. Pragmatique et compréhension du langage chez l'enfant: une étude des formes non littérales avec un paradigme informatisé. *Année Psychologique* 106. 491–512. DOI: <https://doi.org/10.4074/S0003503306004015>
- Chiappe, Dan L. & Kennedy, John M. 2001. Literal bases for metaphor and simile. *Metaphor and Symbol* 16. 249–276. DOI: <https://doi.org/10.1080/10926488.2001.9678897>
- Clark, Eve V. 1982. The young word maker: A case study of innovation in the child's lexicon. In Wanner, Eric & Gleitman, Lila R. (eds.), *Language Acquisition: The State of the Art*, 390–425. Cambridge University Press.
- Clark, Eve V. 1987. The principle of contrast: A constraint on language acquisition. In MacWhinney, Brian (ed.), *Mechanisms of Language Acquisition*, 1–33. Lawrence Erlbaum Associates, Inc.
- Clark, Eve V. 1993. *The Lexicon in Acquisition*. Cambridge: Cambridge University Press.
- Clark, Eve V. & Berman, Ruth A. 1984. Structure and use in the acquisition of word formation. *Language* 60(3). 542–590. DOI: <https://doi.org/10.2307/413991>
- Clark, Eve V. & Clark, Herbert H. 1979. When nouns surface as verbs. *Language* 55(4). 767–811. DOI: <https://doi.org/10.2307/412745>
- Conwell, Erin & Morgan, J. 2012. Is it a noun or is it a verb? Resolving the ambicategoricity problem. *Language Learning and Development* 8(2). 87–112. DOI: <https://doi.org/10.1080/15475441.2011.580236>
- Copesake, Ann & Briscoe, Ted. 1995. Semi-productive polysemy and sense extension. *Journal of Semantics* 12(1). 15–67. DOI: <https://doi.org/10.1093/jos/12.1.15>
- Dahl, Östen & Fraurud, Kari. 1996. Animacy in grammar and discourse. In Fretheim, Thorstein & Gundel, Jeanette K. (eds.), *Reference and Referent Accessibility*, 47–64. Amsterdam: John Benjamins. DOI: <https://doi.org/10.1075/pbns.38.04dah>
- de Swart, Henriette & Winter, Yoad & Zwarts, Joost. 2007. Bare nominals and reference to capacities. *Natural Language and Linguistic Theory* 25. 195–222. DOI: <https://doi.org/10.1007/s11049-006-9007-4>
- Echols, Catherine H. & Marti, Nathan C. 2004. The identification of words and their meanings: From perceptual biases to language-specific cues. In Hall, D. Geoffrey & Waxman, Sandra R. (eds.), *Weaving a lexicon*, 41–78. Cambridge, MA: MIT Press.
- Fennell, Cristopher T. 2006. Infants of 14 months use phonetic detail in novel words embedded in naming phrases. In Banman, David & Magnitskai, Tatiana & Zaller, Colleen (eds.), *Proceedings of the 30th annual Boston University Conference on Language Development*, 178–189. Somerville, MA: Cascadilla Press.
- Floyd, Sammy & Goldberg, Adele E. & Lew-Williams, Casey. 2020. Toddlers recognize multiple meanings of polysemous words. *Proceedings of the 42nd Annual Conference of the Cognitive Science Society*, 2799–2804.
- Floyd, Sammy & Goldberg, Adele. 2020. Children make use of relationships across meanings in word learning. *Journal of Experimental Psychology: Learning, Memory, and Cognition* 47(1), 29–44. DOI: <https://doi.org/10.1037/xlm0000821>

- Gentner, Dedre. 1977. If a tree had a knee, where would it be? Children's performance on simple spatial metaphors. *Papers and Reports on Child Language Development* 13. 157–164.
- Gentner, Dedre. 1988. Metaphor as structure mapping: The relational shift. *Child Development* 59. 47–59. DOI: <https://doi.org/10.2307/1130388>
- Gentner, Dedre & Bowdle, Brian. 2008. Metaphor as structure-mapping. In Gibbs, Raymond W. Jr. (ed.), *The Cambridge Handbook of Metaphor and Thought*, 109–128. Cambridge University Press. DOI: <https://doi.org/10.1017/CBO9780511816802.008>
- Givón, Talmy. 1983. *Topic Continuity in Discourse*. Amsterdam: John Benjamins. DOI: <https://doi.org/10.1075/tsl.3>
- Glucksberg, Sam. 2011. Understanding metaphors: The paradox of unlike things compared. In Ahmad, Khurshid (ed.), *Affective Computing and Sentiment Analysis: Emotion, Metaphor and Terminology*, 1–12. New York, NY: Springer. DOI: https://doi.org/10.1007/978-94-007-1757-2_1
- Glucksberg, Sam & Haught, Catrinel. 2006. Can Florida become like the next Florida? When metaphoric comparisons fail. *Psychological Science* 17(11). 935–938. DOI: <https://doi.org/10.1111/j.1467-9280.2006.01807.x>
- Glucksberg, Sam & Keysar, Boaz. 1990. Understanding metaphorical comparisons: Beyond similarity. *Psychological Review* 97(1). 3–18. DOI: <https://doi.org/10.1037/0033-295X.97.1.3>
- Glucksberg, Sam & Newsome, Mary R. & Goldvarg, Yevgeniya. 2001. Inhibition of the literal: Filtering metaphor-irrelevant information during metaphor comprehension. *Metaphor and Symbol* 16(3–4). 277–298. DOI: <https://doi.org/10.1080/10926488.2001.9678898>
- Goldberg, Adele E. 2006. *Constructions at Work: The Nature of Generalization in Language*. Oxford: Oxford University Press. DOI: <https://doi.org/10.1093/acprof:oso/9780199268511.001.0001>
- Goldberg, Adele E. 2013. The emergence of the semantics of argument structure constructions. In MacWhinney, Brian (ed.), *The Emergence of Language*, 215–230. New York: Psychology Press. DOI: <https://doi.org/10.4324/9781410602367-12>
- Grestenberger, Laura & Kastner, Itamar. 2022. Directionality in cross-categorical derivations. *Glossa: a journal of general linguistics* 7(1). DOI: <https://doi.org/10.16995/glossa.8710>
- Guasti, Maria Teresa & Alexiadou, Artemis & Sauerland, Uli. 2023. Undercompression errors as evidence for conceptual primitives. *Frontiers of Psychology* 14. 1104930. DOI: <https://doi.org/10.3389/fpsyg.2023.1104930>
- Hale, Ken & Keyser, Samuel J. 2002. *Prolegomenon to a Theory of Argument Structure*. Cambridge: MIT Press. DOI: <https://doi.org/10.7551/mitpress/5634.001.0001>
- Halle, Morris & Marantz, Alec. 1993. Distributed morphology and the pieces of inflection. In Hale, K. & Keyser, Samuel J. (eds.), *The View from Building 20: Essays in Linguistics in Honor of Sylvain Bromberger*, 111–176. Cambridge: MIT Press.
- Harley, Heidi & Haugen, Jason. 2007. Are there really two classes of instrumentals? *Snippets* 16. 6–7.
- He, Angela X. & Wittenberg, Eva. 2020. The acquisition of event nominals and light verb constructions. *Language and Linguistic Compass* 14. e12363. DOI: <https://doi.org/10.1111/lnc3.12363>

- Kambanaros, Maria & Grohmann, Kleanthes K. 2013. Profiling (specific) language impairment in bilingual children: Preliminary evidence from Cyprus. In Mueller Gathercole, Virginia C. (ed.), *Solutions for the Assessment of Bilinguals*, 146–174. Bristol: Multilingual Matters. DOI: <https://doi.org/10.21832/9781783090150-010>
- Kelly, Michael H. 1998. Rule- and idiosyncratically derived denominal verbs: Effects on language production and comprehension. *Memory and Cognition* 26(2). 369–381. DOI: <https://doi.org/10.3758/BF03201147>
- Kiparsky, Paul. 1997. Remarks on denominal verbs. In Alsina, Alex & Bresnan, Joan & Sells, Peter. *Complex Predicates*, 473–499. Stanford: CSLI.
- Kuczaj, Stanley A. 1978. Children's judgements of grammatical and ungrammatical irregular past-tense verbs. *Child Development* 49(2). 319–326. DOI: <https://doi.org/10.1111/j.1467-8624.1978.tb02318.x>
- Hirsh-Pasek, Kathy & Golinkoff, Roberta M. 1996. The intermodal preferential looking paradigm: A window onto emerging language comprehension. In McDaniel, Dana & McKee, Cecile & Grains, Helen (eds.), *Methods for Assessing Children's Syntax*, 105–124. Cambridge: MIT Press.
- Johnson, Janice & Pascual-Leone, Juan. 1989. Developmental levels of processing in metaphor interpretation. *Journal of Experimental Child Psychology* 48(1). 1–31. DOI: [https://doi.org/10.1016/0022-0965\(89\)90038-6](https://doi.org/10.1016/0022-0965(89)90038-6)
- Kiss, Katalin É. & Zétényi, Tamás. 2017. Quantifier spreading: children misled by ostensive cues. *Glossa: a journal of general linguistics* 2(1). 38. 1–20. DOI: <https://doi.org/10.5334/gjgl.147>
- Kratzer, Angelika. 1996. Severing the external argument from its verb. In Rooryck, Johan & Zaring, Laura (eds.), *Phrase Structure and the Lexicon*. Dordrecht: Kluwer. DOI: https://doi.org/10.1007/978-94-015-8617-7_5
- Lakoff, George. 1991. Cognitive versus Generative Linguistics: How commitments influence results. *Language and Communication* 11(1–2). 53–62. DOI: [https://doi.org/10.1016/0271-5309\(91\)90018-Q](https://doi.org/10.1016/0271-5309(91)90018-Q)
- Lakoff, George & Johnson, Mark. 1980. *Metaphors We Live By*. Chicago: The University of Chicago Press.
- Levin, Beth. 1993. *English Verb Classes and Alternations*. Chicago, IL: University of Chicago Press.
- Lieber, Rochelle. 1992. *Deconstructing Morphology: Word Formation in Syntactic Theory*. Chicago: University of Chicago Press.
- Lieber, Rochelle. 2004. *Morphology and Lexical Semantics*. Cambridge University Press.
- Lippeveld, Marie & Oshima-Takane, Yuriko. 2011. The dax is daxing the cheese: When do children acquire class extension rules for denominal verbs? In Danis, Nick & Mesh, Kate & Sung, Hyunsuk (eds.), *Proceedings supplement of the 35th Annual Boston University Conference on Language Development [BUCLD]*. Somerville, MA: Cascadilla Press.
- Lippeveld, Marie & Oshima-Takane, Yuriko. 2013. Verbs to nouns and nouns to verbs: When do children acquire class extension rules for deverbal nouns and denominal verbs? *Applied Psycholinguistics* 36(3). 559–588. DOI: <https://doi.org/10.1017/S0142716413000349>

- Lippeveld, Marie & Oshima-Takane, Yuriko. 2015. The effect of input on children's cross-categorical use of polysemous noun-verb pairs. *Language Acquisition* 22(3). 209–239. DOI: <https://doi.org/10.1080/10489223.2014.943902>
- Lippeveld, Marie & Oshima-Takane, Yuriko. 2020. Children's initial understanding of the related meanings of polysemous noun-verb pairs. *Language Learning and Development* 16(3). 244–269. DOI: <https://doi.org/10.1080/15475441.2020.1737073>
- Marantz, Alec. 1997. No escape from syntax: Don't try morphological analysis in the privacy of your own lexicon. In *Proceedings of the 21st Penn Linguistics Colloquium*. Philadelphia: University of Pennsylvania Working Papers in Linguistics.
- Markman, Ellen M. 1989. *Categorization and Naming in Children: Problems of Induction*. MIT Press.
- Martin, Fabienne & Piñón, Cristopher. 2020. Verbalizing nouns and adjectives: The case of behavior-related verbs. *Glossa: a journal of general linguistics* 5(1). 29. DOI: <https://doi.org/10.5334/gjgl.833>
- Martin, Fabienne & Nie, Yining & Alexiadou, Artemis & Guasti, Maria Teresa. 2022. Wearing Causation on Its Sleeve: Overt cause in Child French Causatives. In Gong, Ying & Kpogo, Felix (eds.), *Proceedings of the 46th Annual Boston University Conference on Language Development*, 497–510. Somerville, MA: Cascadilla Press.
- Miller, George A. 1974. Toward a third metaphor for psycholinguistics. In Weimer, Walter B. & Palermo, David S. (eds.), *Cognition and the Symbolic Processes*. Hillsdale, NJ, Lawrence Erlbaum.
- Miller, George A. & Johnson-Laird, Philip N. 1976 (2013). *Language and Perception*. Cambridge, England: Harvard University Press. DOI: <https://doi.org/10.4159/harvard.9780674421288>
- Miller, George A. & Glucksberg, Sam. 1988. Psycholinguistic aspects of pragmatics and semantics. *Steven's Handbook of Experimental Psychology*, 417–472.
- Murphy, Gregory L. 2007. Parsimony and the psychological representation of polysemous words. In Rakova, Marina & Petho, Gergely & Rakosi, Csilla (eds.), *The Cognitive Basis of Polysemy*, 47–70. Frankfurt am Main, Germany: Peter Lang Verlag.
- Nall, Susan Lynn. 1983. Dimensions of metaphor comprehension in third, fifth and seventh graders. Wake Forest University, NC, Dept. of Psychology, Unpublished Master's Thesis.
- Newmeyer, Frederick J. 2011. Bridges between generative and cognitive linguistics. In de Stadler, Leo & Eyrich, Cristopher. *Issues in Cognitive Linguistics: 1993 Proceedings of the International Cognitive Linguistics Conference*, 3–20. Berlin, New York: De Gruyter Mouton.
- Nicolae, Andreea C. & Yatsushiro, Kazuko. 2020. Not eating kein veggies: Negative concord in child German. In Hörnig, Robin & von Wietersheim, Sophie & Konietzko, Andreas & Featherston, Sam (eds.), *Proceedings of Linguistic Evidence 2020: Linguistic Theory Enriched by Experimental Data*, 317–332. Tübingen: University of Tübingen.
- Ortony, Andrew. 1979. Beyond literal similarity. *Psychological Review* 86(3). 161–180. DOI: <https://doi.org/10.1037/0033-295X.86.3.161>
- Ortony, Andrew. (ed.) 1993. *Metaphor and Thought*. Cambridge University Press. DOI: <https://doi.org/10.1017/CBO9781139173865>

- Oshima-Takane, Yuriko & Barner, David & Elsabbagh, Mayada & Guerriero, Sonia. 2001. Learning of deverbal nouns. In Almgren, Margareta & Barreña, Andoni & Ezeizabarrena, Maria-José & Idiazabal, Itziar & MacWhinney, Brian (eds.), *Research on Child Language Acquisition: Proceedings for the 8th Congress of the International Association for the Study of Child Language*. Somerville, MA: Cascadilla Press.
- Oshima-Takane, Yuriko & Miyata, Susanne & Naka, Norio. 2000. Acquisition of grammatical categories: The role of physical objects and input. *Studies in Language Sciences* 1. 97–109.
- Özçalışkan, Şeyda. 2007. Metaphors we move by: Children's developing understanding of metaphorical motion in typologically distinct languages. *Metaphor & Symbol* 22(2). 147–168. DOI: <https://doi.org/10.1080/10926480701235429>
- Özçalışkan, Şeyda & Goldin-Meadow, Susan & Gentner, Dedre & Mylander, Carolyn. 2009. Does language about similarity play a role in fostering similarity comparison in children? *Cognition* 112(2). 217–228. DOI: <https://doi.org/10.1016/j.cognition.2009.05.010>
- Paivio, Allan. 1979. Psychological processes in the comprehension of metaphor. In Andrew Ortony (ed.), *Metaphor and Thought*, 150–171. New York: Cambridge University Press.
- Plag, Ingo. 1999. *Morphological Productivity: Structural Constraints in English Derivation*. Berlin: de Gruyter.
- Ramchand, Gillian. 2008. *Verb Meaning and the Lexicon*. Cambridge, MA: MIT Press. DOI: <https://doi.org/10.1017/CBO9780511486319>
- Ramchand, Gillian. 2014. Deriving variable linearization. A commentary on Simpson and Syed (2013). *Natural Language and Linguistic Theory* 32. 263–282. DOI: <https://doi.org/10.1007/s11049-013-9225-5>
- Ramiro, Christian & Srinivasan, Mahesh & Malt, Barbara C. & Xu, Yang. 2018. Algorithms in the historical emergence of word meanings. *Proceedings of National Academy of Sciences* 115(10). 2323–2328. DOI: <https://doi.org/10.1073/pnas.1714730115>
- R Core Team. 2021. R: A language and environment for statistical computing. R Foundation for Statistical Computing. Vienna, Austria. Available online at <https://www.R-project.org/>.
- Recanati, François. 2004. *Literal Meaning*. Cambridge, UK: Cambridge University Press. DOI: <https://doi.org/10.1017/CBO9780511615382>
- Reynolds, Ralph E. & Ortony, Andrew. 1980. Some issues in the measurement of children's comprehension of metaphorical language. *Child Development* 51(4). 1110–1119. DOI: <https://doi.org/10.2307/1129551>
- Roncero Carlos & Kennedy, John M. & Smyth, Ron. 2006. Similes on the internet have explanations. *Psychonomic Bulletin and Review* 13. 74–77. DOI: <https://doi.org/10.3758/BF03193815>
- Roncero, Carlos & de Almeida, Roberto G. & Martin, Deborah C. & de Caro, Marco. 2016. Aptness predicts metaphor preference in the lab and on the internet. *Metaphor and Symbol* 31(1). 31–46. DOI: <https://doi.org/10.1080/10926488.2016.1116908>
- Rubio-Fernández, Paula. 2007. Suppression in metaphor interpretation: Differences between meaning selection and meaning construction. *Journal of Semantics* 24(4). 345–371. DOI: <https://doi.org/10.1093/jos/ffm006>

- Sauerland, Uli & Alexiadou, Alexiadou. 2020. Generative Grammar: A Meaning First Approach. *Frontiers in Psychology* 23(11). 571295. DOI: <https://doi.org/10.3389/fpsyg.2020.571295>
- Seidenberg, Pearl L. & Bernstein, Deena K. 1986. The comprehension of similes and metaphors by learning disabled and nonlearning-disabled children. *Language, Speech, and Hearing Services in Schools* 17(3). 219–229. DOI: <https://doi.org/10.1044/0161-1461.1703.219>
- Slobin, Dan I. 1973. Cognitive prerequisites for the development of grammar. In Ferguson, Charles A & Slobin, Dan I. (eds.), *Studies in Child Language Development*, 175–208. New York: Holt, Rinehart, Winston.
- Song, Yusi. 2020. Simile and metaphor interpretation in children. *English Language Teaching* 13(4). 91–103. DOI: <https://doi.org/10.5539/elt.v13n4p91>
- Sperber, Dan & Wilson, Deirdre. 2008. A deflationary account of metaphors. In Gibbs Jr., Raymond W. (ed.), *The Cambridge Handbook of Metaphor and Thought*, 84–105. DOI: <https://doi.org/10.1017/CBO9780511816802.007>
- Srinivasan, Mahesh & Al-Mughairy, Sara & Foushee, Ruthe & Barner, David. 2017. Learning language from within: Children use semantic generalizations to infer new word meanings. *Cognition* 159. 11–24. DOI: <https://doi.org/10.1016/j.cognition.2016.10.019>
- Srinivasan, Mahesh & Berner, Catherine & Rabagliati, Hugh. 2019. Children use polysemy to structure new word meanings. *Journal of Experimental Psychology: General* 148(5). 926–942. DOI: <https://doi.org/10.1037/xge0000454>
- Srinivasan, Mahesh & Rabagliati, Hugh. 2015. How concepts and conventions structure the lexicon: Cross-linguistic evidence from polysemy. *Lingua* 157. 124–152. DOI: <https://doi.org/10.1016/j.lingua.2014.12.004>
- Srinivasan, Mahesh & Rabagliati, Hugh. 2021. The implications of polysemy for theories of word learning. *Child Development Perspectives* 15(3). 148–153. DOI: <https://doi.org/10.1111/cdep.12411>
- Srinivasan, Mahesh & Snedeker, Jesse. 2011. Judging a book by its cover and its contents: The representation of polysemous and homophonous meanings in four-year-old children. *Cognitive Psychology* 62(4). 245–272. DOI: <https://doi.org/10.1016/j.cogpsych.2011.03.002>
- Štekauer, Pavol. 2005. *Meaning Predictability in Word-formation*. Amsterdam/Philadelphia: John Benjamins. DOI: <https://doi.org/10.1075/sfsl.54>
- Štekauer, Pavol. 2006. Onomasiological theory of word-formation. In Keith Brown (ed.), *Encyclopedia of language and linguistics*, 34–37. Oxford: Elsevier. DOI: <https://doi.org/10.1016/B0-08-044854-2/00122-X>
- Štekauer, Pavol, Díaz-Negrillo, Ana & Valera Salvador. 2011. Meaning predictability and conversion. *Folia Linguistica* 45. 165–198. DOI: <https://doi.org/10.1515/flin.2011.006>
- Siltanen, Susan A. 1990. Effects of Explicitness on Children's Metaphor Comprehension. *Metaphor and Symbolic Activity* 5(1). 1–20. DOI: https://doi.org/10.1207/s15327868ms0501_1
- Svenonius, Peter. 2012. Spanning. Ms. University of Tromsø. Available online: <ling.auf.net/lingbuzz/001501>

- Svenonius, Peter. 2016. Spans and words. In Harley, Heidi & Siddiqi, Daniel (eds.), *Morphological Metatheory*, 199–220. Amsterdam: John Benjamins. DOI: <https://doi.org/10.1075/la.229.07sve>
- Thornton, Rosalind & Notley, Anna & Moscati, Vincenzo & Crain, Stephen. 2016. Two negations for the price of one. *Glossa: a journal of general linguistics* 1(1): 45. 1–30. DOI: <https://doi.org/10.5334/gjgl.4>
- Tomasello, Michael. 2000. First steps toward a usage-based theory of language acquisition. *Cognitive Linguistics* 11(1–2). 61–82. DOI: <https://doi.org/10.1515/cogl.2001.012>
- Tomasello, Michael. 2003. *Constructing a Language: A Usage-based Theory of Language Acquisition*. Cambridge, MA: Harvard University Press.
- Tyler, Andrea & Evans, Vyvyan. 2001. Reconsidering prepositional polysemy networks: The case of over. *Language* 77(4). 724–765. DOI: <https://doi.org/10.1515/9783110895698.95>
- van Hout, Angeliek. 1998. On learning the role of direct objects for telicity in Dutch and English. *University of Massachusetts Occasional Papers in Linguistics* 24(9). Available at: <https://scholarworks.umass.edu/umop/vol24/iss1/9>.
- von Heusinger, Klaus & Wespel, Johannes. 2007. Indefinite proper names and quantification over manifestations. In Puig-Waldmüller, Estella (ed.), *Proceedings of Sinn und Bedeutung* 11. 332–345. Barcelona: Universitat Pompeu Fabra.
- Vosniadou, Stella. 1989. Context and the development of metaphor comprehension. *Metaphor and Symbolic Activity* 4(3). 159–171. DOI: https://doi.org/10.1207/s15327868ms0403_4
- Vosniadou, Stella & Ortony, Andrew. 1983. The emergence of the literal-metaphorical-anomalous distinction in young children. *Child Development* 54(1). 154–161. DOI: <https://doi.org/10.2307/1129872>
- Waggoner, John E. & Palermo, David S. & Kirsh, Steven J. 2017. Bouncing bubbles can pop: Contextual children’s metaphor comprehension and production sensitivity in children’s metaphor comprehension. *Metaphor & Symbol* 12(4). DOI: https://doi.org/10.1207/s15327868ms1204_1
- Waxman, Sandra R. & Booth, Amy E. 2001. Seeing pink elephants: Fourteen-month-olds’ interpretations of novel nouns and adjectives. *Cognitive Psychology* 43(3). 217–242. DOI: <https://doi.org/10.1006/cogp.2001.0764>
- Wittenberg, Eva. 2018. He gave my nose a kick or he kicked my nose? Argument Structure Alternations and Event Construal. *Psychology of Learning and Motivation* 68. 337–360. DOI: <https://doi.org/10.1016/bs.plm.2018.08.008>
- Yamakoshi, Kyoko & Miura, Kaori & Jorinbo, Hanako & Angata, Kayoko & Yamasaki, Kaori. 2018. An experimental study of children’s comprehension of lexical and productive causatives in Japanese. In *Topics in theoretical Asian linguistics: studies in honor of John B. Whitman*, 229–250. Amsterdam & Philadelphia: John Benjamins. DOI: <https://doi.org/10.1075/la.250.12yam>

