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The Relationship between Definitional Skills and Listening Comprehension: Preliminary Evidence from Preschoolers to School-Aged Children

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ABSTRACT

Background: Definitional skills represent the ability to express words' meaning using canonical formats (i.e., 'a cat is a domestic animal that meows'). This complex linguistic production requires lexical, semantic, morphosyntactic, pragmatic and metalinguistic abilities, all implicitly mastered in language listening comprehension. Listening comprehension has a crucial role also in the cognitive linguistic mediated development, especially in promoting future reading comprehension. The relationship between definitional skills and listening comprehension is an underinvestigated topic.

Purpose: The aim of the present study was to explore this relationship in preschoolers and in school-aged children (first and third graders).

Method: Fifty-seven Italian children (age range: 44-106 months) were individually administered both a definition task, that requires to produce the definition of noun, verbs, and adjectives, scored by the Scale of Definitional Competence (Co.De. Scale), and the Test for Oral Reading Comprehension (TOR) that assesses textual and inferential listening comprehension via two brief stories.

Results: We found preliminary evidence of a bidirectional relationship between definitional skills and listening comprehension both in preschoolers and in school-aged children. Age explains a significant portion of variance of definitional skills (over listening comprehension); whereas definitional skills account for listening comprehension (in particular, textual comprehension).

Conclusion: The results are discussed in the light of the bidirectional link emerged from the analyses, promoting an initial reflection on the complex relationship between a metalinguistic ability (i.e., definitional skills) and listening comprehension processes both involved in school achievement.

KEYWORDS

definitional skills, listening comprehension, metalinguistic ability, language development

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INTRODUCTION

Language development in children is a multifaceted process involving the dynamic interplay of various cognitive, linguistic, and metalinguistic competencies. Among these, listening comprehension and definitional skills represent two critical domains that contribute not only to early language acquisition but also to subsequent academic success. While the role of listening comprehension as a predictor of reading comprehension has been extensively documented (Kendeou

et al., 2007), and definitional skills have been recognized for their importance in metalinguistic development (Belacchi & Benelli, 2017), the relationship between these two abilities remains largely unexplored.

Listening comprehension has been shown to play a pivotal role in language development and literacy. Kendeou et al. (2007) demonstrated through a longitudinal study that early comprehension of audio and television narratives significantly predicts later reading comprehension.



sion. Similarly, Daneman and Blennerhassett (1984) established that complex span tasks, such as the listening span test, are robust predictors of listening comprehension in preschoolers. These findings underscore the central role of cognitive processes like working memory, lexical-semantic access, and syntactic representation in supporting listening comprehension. Moreover, Kim (2015) identified both direct and mediated pathways linking low-level cognitive-linguistic skills (e.g., vocabulary, working memory, syntactic knowledge) with higher-order comprehension monitoring and Theory of Mind, which in turn predict listening comprehension performance.

Parallel to listening comprehension, definitional skills (defined as the ability to articulate the semantic content of words in a structured and explicit manner) are rooted in metalinguistic awareness. Defining words requires not only a robust lexical-semantic network but also the capacity to reflect on language itself, distinguishing between form and meaning (Snow, 1990; McKeown, 1993; Nippold, 1995; Belacchi & Benelli, 2017; Artuso et al., 2024). This metalinguistic competence is crucial for effective communication, as it enables individuals to share complex cultural and conceptual knowledge through conventional linguistic forms. The development of definitional skills is influenced by both intrinsic cognitive factors and extrinsic educational experiences. For instance, Benelli et al. (2006) found that formal education significantly enhances definitional competence, with highly educated adults outperforming their less-educated peers in producing lexically rich and semantically precise definitions. Furthermore, strong definitional skills have been linked to academic achievement, particularly in scientific subjects, where precise terminology and conceptual clarity are essential (Artuso et al., 2022).

Despite the well-documented importance of both listening comprehension and definitional skills, research has largely treated them as separate constructs. However, theoretical models suggest potential overlap, as both abilities engage metarepresentational processes. These include the capacity to adopt another's perspective, monitor one's own understanding, and manipulate linguistic structures to convey meaning effectively (Florit et al., 2014; Lepola et al., 2012). Listening comprehension relies on the integration of lexical, syntactic, and inferential skills to construct meaning from spoken language, while definitional skills require the explicit articulation of these meanings within a conventional framework. This conceptual overlap raises important questions about whether and how these abilities influence each other during developmental trajectories.

The current study aims to address this gap by investigating the relationship between listening comprehension and definitional skills in a sample of preschool and early school-aged children. Building on the premise that both abilities reflect underlying metalinguistic and cognitive capacities, we hypothesize that they are interrelated, with definitional skills

potentially serving as a predictor of listening comprehension. This hypothesis is grounded in the Lexical Quality Hypothesis (Perfetti, 2007), which posits that high-quality lexical representations (characterized by strong form-meaning connections) facilitate efficient language processing. Given that definitional skills reflect a high level of lexical quality through their demand for precise, decontextualized semantic representations, it is plausible that they contribute to the development of listening comprehension.

Furthermore, we anticipate that age will play a moderating role in this relationship, with definitional skills showing greater age-related improvements due to the influence of formal education, while listening comprehension may stabilize earlier as result of natural language exposure. This expectation aligns with previous findings that suggest definitional competence continues to develop throughout the primary school years, influenced by both cognitive maturation and educational experiences (Dourou et al., 2020; Belacchi & Benelli, 2021).

This study seeks to advance our understanding of the interconnectedness of key language competencies by exploring the relationship between listening comprehension and definitional skills. By examining this relationship across different developmental stages, we aim to contribute to theoretical models of language acquisition and provide insights that could inform educational practices designed to enhance both comprehension and metalinguistic abilities in young learners.

METHOD

Participants

The sample was composed of 57 children, monolingual Italian native speaker. Participants were divided into three age ranges: 17 preschoolers aged 44 to 59 months (M age = 51 months, SD = 5.46 months); 20 first grade children aged 70-81 months (M age = 76 months, SD = 3.09 months); 20 third grade children aged 95 to 106 months (M age = 100 months, SD = 2.89 months). No child showed learning disorders or any other neurodevelopmental disorder. The study fulfilled the ethical standard procedures recommended by the Italian Association of Psychology and the Declaration of Helsinki (1964). Written informed parental consent, as well as oral informed child assent, was obtained and collected prior to participation, according to the ethical norms in our university.

Materials and Procedure

Data were collected at school, in a silent room, by a master student ad hoc trained. Two tasks were individually administered in sequence, to tap definitional skills and listening

comprehension as described below. The single session lasted about 30 minutes.

Definitional skills: Co.De. Scale

The scale was devised by Belacchi and Benelli (2007; 2021) in Italian for participants aged 3 years onward (to adult age). The scale comprises 24 stimulus words belonging to three grammatical categories: eight nouns (*ability, clown, donkey, kindness, orange, rivalry, spying, umbrella*), eight adjectives (*blonde, contagious, innocent, polite, risky, round, smooth, thin*), and eight verbs (*to baffle, to burn, to connect, to emigrate, to force, to beat, to think, to tolerate*). Within each category, half of the items were concrete (e.g., *clown, blonde, to hit*), whereas the other half was abstract (e.g., *kindness, innocent, to think*). All responses were codified with a detailed scoring procedure that allows clustering responses into 7 levels hierarchically organized from a non definitional level (score 0) to a formal definition level (score 6) following the assumptions presented in the introduction.

In particular, the 7 response levels (starting from Level 0 where no language is used to refer to the word referent) realize a progressive increase in the analytical expression of semantic content, thanks to the increment of the morphosyntactic articulation and formal complexity of the verbal responses: from a simple Associative word (e.g. Level 1= clown → “circus”), to the addition of some Preposition to the simple word (clown → “at the circus”) or even to the production of Subordinate clauses with no main clauses (clown → “when you go to circus”) (Level 2).

These formally incomplete levels are followed using Autonomous clauses, with narrative/descriptive intent (Level 3: clown → “I often go to the circus with my grandfather”; or “Clowns are funny”).

Then, the expression of Categorical membership is reached (Level 4: clown → “is a character”), followed by the use an Aristotelian phrase structure still without semantic correspondence (Level 5: clown → “is a character who works at the circus”). Finally, the unambiguous identification of the intended referent (Level 6: clown → “a character who makes people laugh at the circus”), achieves the prescriptive semantic equivalence and realizes a perfect circularity between defining and naming (Greimas, 1976).

Example answers and scoring are reported in Table 1.

Children were interviewed individually. To not influence their answers, children were not exposed to possible responses and example of definitions. They were asked to answer the following question: ‘What does the word _ mean?’. The experimenter transcribed their definitions *verbatim*, and the responses were judged on a same 7-level scale by two independent raters who disambiguated uncertain definitions. To avoid suggesting any type of definition, no examples were given; indeed, the objective of the task was to observe whether and how different definitional formats emerge. Thus, all types of answers were accepted. The definitional level was considered as higher as its format was syntactically more articulated, organized, autonomous, and semantically correct.

The seven-level definitional scale and correspondent scores with the examples of possible answers are synthetized in Table 1.

Test for Listening Comprehension

The Test for Oral Reading Comprehension (TOR 3-8, Levorato & Roch, 2007) was designed for Italian children aged 3 to 8 years, representatives of different geographical areas and

Table 1

Definitional Levels, Examples of Prototypical Answers and Scores for Names (cat), Adjectives (blonde) and Verbs (to beat)

Level	Kind of answer	Score
0. Non-definitions	No answer or non-verbal answers	0
1. Pre-definitions	One-word answers, for example associations (<i>cat</i> → <i>moustaches</i> ; <i>blonde</i> → <i>hair</i> ; <i>beat</i> → <i>hammer</i>)	1
2. Nearly-definitions	Initial formulation of sentences, without autonomous forms (<i>cat</i> → <i>with the long mustaches</i> ; <i>blonde</i> → <i>fair hair</i> ; <i>beat</i> → <i>a sports champion</i>)	2
3. Narrative/descriptive definitions	Formally correct and autonomous sentences, with narrative/descriptive content (<i>cat meows</i> ; <i>blonde is someone who has fair hair</i> ; <i>beat means improving a limit</i>)	3
4. Simple categorical definitions	Formally correct and autonomous sentences in simply categorical/ synonymic form (<i>the cat is an animal</i> ; <i>blonde is a colour</i> ; <i>beat is a verb</i>)	4
5. Partial formal definitions	Formal correctness without semantic equivalence (<i>the cat is an animal with four legs</i> ; <i>blonde is a hair colour</i> ; <i>beat means push strongly a lot of times</i>)	5
6. Formal Aristotelian definitions	Formal and semantic correctness and equivalence (<i>a cat is an animal that meows</i> ; <i>blonde is a fair hair colour</i> ; <i>beat means strike someone or something repeatedly</i>)	6

socio-cultural levels. The TOR is the most largely used test for assessment of oral comprehension in Italian children. The original test consists of different tasks for different ages. Each task is composed of two brief stories comparable for difficulty and length. The test shows satisfactory internal reliability as reported in the manual (from 0.52 to 0.72). Indeed, the stories are appropriate, in their cognitive and linguistic demands, to the age of participants. The stories were read aloud to each child by the master student, following the instruction manual (see Levorato & Roch). Comprehension was evaluated via 10 questions per story, each one with four options, orally presented, with words only. Half of the questions were based on information which is already explicitly mentioned (i.e., textual questions) and the other half requested to generate inferences starting from what is said in the text (i.e., inferential questions). The sum of the correct answers for the two stories ranges from 0 to 20 (each story ranged from 0 to 10).

Analyses

We adopted a quasi-experimental design (age was a variable of interest). A correlational design was used to investigate the associations and predictivity among the variables under investigation (age, listening comprehension, definitional skills). First, we conducted a series of analyses (of variance) to investigate age-related effects on the development of definitional skills and listening comprehension. Next, to further investigate age-related effects, we conducted an analysis on percentages of responses per definitional level, to characterize the expected development of this ability. Then, we ran correlational and regression analyses to explore the relationship between these two abilities. In addition, to further evaluate the relationship between definitional skills and listening comprehension, a series of multiple hierarchical regression analyses were conducted to explore the two possible directions of their relation, that is how definitional skills development may impact listening comprehension, and the reverse relationship, as well, that is, how listening comprehension may modulate definitional skills growth. We explored the bi-directional relationship between these two abilities in children, because we had no knowledge of liter-

ature that could give us a robust theoretical basis to justify the rationale, that is, to investigate only one direction of the relationship. For this reason, we investigated both the possible directions previously described.

RESULTS

Age Effects

First, we analyzed the effect of age on the development of both definitional competence and listening text comprehension. Descriptive statistics by age group are reported in Table 2.

A univariate ANOVA was conducted on the definitional skills mean score as dependent variable, and Age as between-participants variable. The results showed that responses vary across different age groups, $F(2, 56) = 16.08, p < .001$. In particular, we found that third graders scored higher than both preschoolers ($t(35) = 3.91, p < .001$) and first graders ($t(38) = 5.30, p < .001$). No significant differences were found between preschoolers and first grade children scores, $t(35) = 1.80, p = .08$.

Then, to distinguish the age contribution to the development of listening comprehension, a repeated measure ANOVA (2 X 3) was run on the two separate components of textual vs. inferential listening comprehension as within-participants variable, and Age group as between-participants variable. The main effect of Age was found, $F(2, 54) = 14.60, p < .001, \eta^2 = .36$. The group of preschoolers scored significantly lower than both the first graders, ($t(35) = 4.51, p < .001$) and the group of third graders ($t(38) = 4.18, p < .001$) on LC total. No differences were found between the two primary school groups ($t(35) = 0.76, p = .45$). See Table 2.

The main effect of Question type was also found, $F(1, 54) = 53.53, p < .001, \eta^2 = .50$: Textual questions ($M = 7.40, SD = 0.22$) reached more accuracy than Inferential questions ($M = 5.62, SD = 0.21$). The interaction between Age group and Question type was not significant, $p = .92$.

Table 2

Descriptive Statistics

	Pre-schoolers	First graders	Third graders	Mean total score
LC Textual	6.10(1.75)	7.85(1.30)	8.24(1.71)	7.40(1.59)
LC Inferential	4.20(1.80)	6.20(1.20)	6.47(1.60)	5.62(1.53)
LC Total	10.30(2.30)	14.00(2.30)	14.70(2.50)	13.00(2.37)
DS	1.86(0.82)	2.34(0.55)	3.11(0.60)	2.44(0.66)

Note. Mean values and SDs (in parentheses) for each measure raw score: listening comprehension (LC) textual, listening comprehension (LC) inferential, listening comprehension (LC) total, and mean definitional skills (DS) score by age group and the mean total scores.

Analysis on Response Percentages per Definitional Level

Further analysis was run to investigate which definition levels are mostly used to define words in the three different age groups, to understand the pattern of development of this metalinguistic skill. Descriptive findings are represented in Figure 1. Independent sample t-tests revealed no significant differences at level 0 (i.e., absence of definition) among the three groups, all $ps > 1$. At level 1 (i.e., pre-definition level), pre-schoolers scored significantly higher than first graders ($t(35) = 2.79, p = .009$), and third graders ($t(38) = 4.58, p < .001$). Also, first graders scored higher than third graders, $t(35) = 2.32, p = .037$.

Levels 2 and 3 revealed no significant differences among the different age groups, all $ps > 1$.

At level 4 (i.e., simple categorical definitions), pre-schoolers scored significantly lower than first graders ($t(35) = 2.77, p = .010$), and third graders ($t(38) = 3.18, p = .004$). No differences emerged between first graders and third graders, $p = .40$.

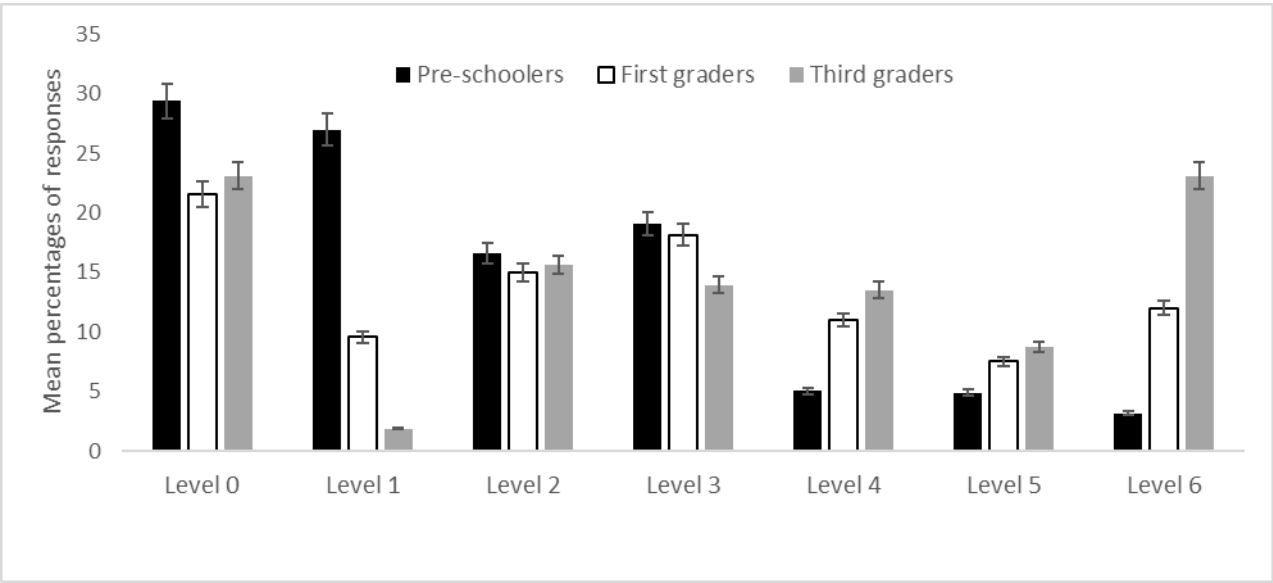
Level 5 revealed no significant differences among groups, as shown in Figure 1 (all $ps > 1$).

Lastly, level 6 revealed that pre-schoolers scored significantly lower than first graders ($t(35) = 4.40, p < .001$), and third graders ($t(38) = 6.58, p < .001$). Also, first graders scored lower than third graders, $t(35) = 3.38, p = .002$.

Correlation and Regression Analyses

In Table 3 correlations are reported between all the target variables and Age, as well as with age partialled out. It can be

Figure 1
Definition by Level



Caption. Mean Percentages of Definition by Scale Level (0-6) and Age Group. Bars Represent SEM

Table 3
Inter-Correlations between Measures

	1.	2.	3.	4.	5.
1. Age	-	.40**	.48**	.50**	.61**
2. LC Textual	-	-	.52**	.87***	.47**
3. LC Inferential	-	.41**	-	.88***	.45**
4. LC Total	-	.85***	.83***	-	.52**
5. DS	-	.30*	.23	.32*	-

Note. All significance tests are two-tailed. *** $p < .001$, ** $p < .01$, * $p < .05$

Caption. Pearson-Moment Inter-Correlations between Measures for the Whole Sample are reported above the diagonal. Correlations partialling out Age are reported below the diagonal

observed that all variables are highly related (all ps ranging from $< .01$ to $< .001$). When partialling out age, the correlations between the four indexes (i.e., definitional skills, total, textual and inferential listening comprehension) remain significant though with lower effect sizes (all ps ranging from $p < .001$ to $p < .05$, except for the inferential comprehension component).

A series of regressions were run with definitional skills as dependent variable and, step by step, Age/listening comprehension measures (sequentially: total, textual and inferential comprehension) as predictors.

As shown in Tables 4, in the first step (see 4.1), age emerged as a significant predictor of definitional skills. In the second step, when Total listening comprehension score was entered, age remained significance, and both age and total listening comprehension were predictors of Definitional skills.

In Table 4.2, it can be observed that, at the second step, textual listening comprehension is a good predictor of definitional skills ($p = 0.20$), beyond Age, but when the inferential component of comprehension is added (at the third step of the regression), the textual component reduces its significance, and the Inferential one does not significantly predict definitional skills.

In the second series of regression (Tables 5), listening comprehension (sequentially: total, textual and inferential measures) were considered as the dependent variable and definitional skills as predictor, beyond age.

At the first step, age emerged as a significant predictor of all listening comprehension measures (total, textual and inferential). In the second step, when definitional skills score was entered, age lost its significance, and definitional skills remained the unique predictor of both total and textual listening comprehension (Tables 5.1, 5.2) but only marginally of inferential listening comprehension (Table 5.3).

DISCUSSION

Age-Related Effects

First, we examined the separate age-related effects on the two abilities, finding the expected increase of both, as children age, though with different and specific trends.

For listening comprehension, we found that school-age children scored significantly higher than preschoolers, whereas no differences were observed between first and third graders, in line with previous findings (Lepola et al., 2012; Levorato & Roch, 2007). Therefore, we confirm that oral comprehension abilities (i.e., basic linguistic skills) develop faster in preschoolers, and become relatively more stable at later ages. In addition, textual listening comprehension

was achieved more easily than the inferential one, in the age groups here considered (see also Levorato & Roch, 2007).

Listening comprehension is a basic ability, and it is plausible that it is particularly influenced by age in the first years of development, when the sharing of the linguistic code is being built up. Afterwards, when children start to master the language in its more complex forms, for example to reflect on the language itself, this metareflective ability (such as definitional skills) becomes prevalent in conditioning listening comprehension.

For the development of definitional skills, no significant differences have been shown between preschoolers and first graders. On the contrary, third graders produced better definitions compared both to preschoolers and first graders. This is plausible and in line with the literature showing that until 6/7 years of age, the definitions are characterized by a descriptive/narrative format (lower levels of the Co.De. Scale, Level 3; Belacchi & Benelli, 2021).

Only starting by 7 years of age, the children's definitions systematically acquire a categorizing format (higher levels of the scale, 4-5-6) in line with the literature on the thematic/paradigmatic shift (see e.g., Artuso et al., 2020; Belacchi et al., 2022; Lucariello et al., 1992). Moreover, our results confirmed that this ability increased with schooling, in agreement with the literature (Artuso & Palladino, 2022; Artuso et al., 2022; Dourou et al., 2020; Gini et al., 2004) and plausibly because schooling specifically promotes the development of explicit linguistic abilities, such as the ability to produce word definitions.

With respect to the development of definitional skills, we have also investigated more in depth the age-related effects by analysing the percentages of responses at the seven different levels of the scale. As represented through Figure 1, by analysing each specific response level, we have shown that younger children report a greater percentage of the simplest responses, that is pre-definitional responses (level 1), characterized by a semantic associative strategy, contextually based (Belacchi et al., 2022). Instead, older children report a greater number of more complex responses, characterized by a taxonomic-hierarchic strategy, such as simple categorical definitions (level 4), and correct formal Aristotelian definitions (level 6). This preliminary finding deserves further analyses to better clarify the time course of definitions development.

The Relationship between Definitional Skills and Listening Comprehension

Afterwards, we focused on the analysis of the relationship between the two constructs.

From the correlation findings (see Table 3) we observe that, though age is significantly and positively associated both to

Table 4
Predictors of Definitional Skills

4.1

Predictors	$R^2(\Delta R^2)$	F	Df	$Beta$	t	P
Step 1	.37(.37)***	31.42	1, 55			
Age				0.60	5.60	.000
Step 2	.44(.07)**	6.88	1, 54			
Age				0.46	3.94	.000
LC Total				0.30	2.62	.011

4.2

Predictors	$R^2(\Delta R^2)$	F	Df	$Beta$	t	P
Step 1	.37(.37)***	32.64	1, 55			
Age				0.61	5.71	.000
Step 2	.43(.06)**	5.71	1, 54			
Age				0.50	4.50	.000
LC Textual				0.28	2.39	.020
Step 3	.44(.008)	0.79	1, 53			
Age				0.47	3.91	.000
LC Textual				0.22	1.82	.075
LC Inferential				0.11	0.89	.379

Caption. Hierarchical regression steps: The role of Age and Listening Comprehension (LC) (4.1 Total; 4.2 Textual and Inferential) on Definitional Skills

Table 5
Predictors of Listening Comprehension

5.1

Predictors	$R^2(\Delta R^2)$	F	Df	$Beta$	t	P
Step 1	.23(.23)***	16.02	1, 55			
Age				0.48	4	.000
Step 2	.32(.09)**	6.88	1, 54			
Age				0.25	1.78	.080
DS				0.38	2.62	.011

5.2

Predictors	$R^2(\Delta R^2)$	F	Df	$Beta$	t	P
Step 1	.16(.16)***	10.05	1, 55			
Age				0.40	3.18	.002
Step 2	.24(.08)**	5.97	1, 54			
Age				0.18	1.17	.248
DS				0.37	2.44	.018

5.3

Predictors	$R^2(\Delta R^2)$	F	Df	$Beta$	t	P
Step 1	.20(.20)***	16.02	1, 55			
Age				0.45	3.73	.000
Step 2	.25(.05)	6.88	1, 54			
Age				0.28	1.89	.065
DS				0.29	1.94	.058

Caption. Hierarchical Regression Steps: The Role of Age and Definitional Skills (DS) on Listening Comprehension Total (5.1), Textual (5.2), Inferential (5.3)

listening comprehension and definitional skills, the effect size is greater relative to definitional skills ($r = .61$), compared to listening comprehension, whose effects sizes are of medium level (LC textual $r = .40$; LC inferential $r = .48$; LC total $r = .50$). This is probably due to the age groups considered in the present study, and to the different developmental patterns of the two abilities considered: a more basic ability such as listening comprehension, being an implicit competence, develops mainly at early ages, whereas, a more specialized ability such as the definitional one, develops later (from 7/8 years of age onward; e.g., Belacchi et al., 2022), when children systematically start using the canonical formats, and continues to improve until adulthood, also thanks to schooling (e.g., Dourou et al., 2020; Gini et al., 2004).

The different role of age in the acquisition of listening comprehension and definitional skills is better underlined by the regression analyses. Age remains the first variable accounting for definitional skills, also when the measures of listening comprehension are entered into the analyses (see Tables 4.1, 4.2). This confirms that mastering the ability to define words requires long learning times, linked to cognitive development and formal instruction (Benelli et al., 2006; Gini et al., 2004). Therefore, it is reasonably partially independent from listening comprehension, the nature of which is more basic and precocious.

On the contrary, when listening comprehension is the dependent variable and age/definitional skills are entered as predictors, age stops being a predictor when it is considered together with definitional skills measures, which assume a specific role to enhance the different comprehension skills (see Tables 5). This finding could be accounted for by the metalinguistic nature of the definitions, which represent a formal and decontextualized kind of knowledge (e.g., Bianco et al. 2022; Cornaggia et al., 2024). Indeed, the metalinguistic awareness (typical of definitional competence) about the importance to provide hypothetical interlocutors with the most effective semantic information, might be extended to other linguistic processes taking place in actual social interactions. In other words, being aware of the existence of shared semantic representational fields, granted by conventional definitions, might foster a similar awareness and more dedicated processes also in natural contexts and inter-

personal communicative exchanges. However, to be sure of this tentative interpretation, higher ages and/or educational levels should be considered, that is, when definitional skills are well-established, as compared to listening abilities, the development of which tends to be more basic and stable.

Our findings represent a first contribution to connect a complex metalinguistic ability (i.e., definitional skills) to listening comprehension. Previously, lower-level and higher-level semantic components were found to be related to listening comprehension (e.g., Perfetti, 2007). To our knowledge, no studies have systematically considered the role of listening comprehension on the development of definitional skills, an ability characterized by meta-linguistic and meta-representative components which make the social sharing of mental representations more effective (Belacchi & Benelli, 2007; 2017). This sharing activity starts being acquired through communicative implicit routines based on listening text comprehension, which is predictive of the ability to make explicit words' meanings (beyond the influence of age). On the other hand, we have found that the age factor decreases its effectiveness on listening comprehension, which is specifically boosted by the same metalinguistic attitude characterizing definitional skills.

Limitations

A few limitations should be accounted for. First, the relatively low sample numerosity (albeit of three different age groups) restricts the study to an exploratory investigation. However, we believe that the novelty of the topic and its heuristic potential can obviate to such a reduced sample. Among future developments, it would be valuable to increase sample numerosity and further investigate possible mediation effects between the variables considered.

Second, the utilization of additional measures could have provided richer and more convincing findings; for example, the assessment of cognitive level, besides vocabulary measures, as well as word knowledge and morpho-syntactic measures could represent the lower-level semantic components involved in definitional skills, being the same involved in listening comprehension. In addition, to better assess the role of definitional skills on comprehension development

and vice versa, longitudinal designs should be implemented in future studies.

Conclusion

We found preliminary evidence of a bidirectional relationship between definitional skills and listening comprehension both in preschoolers and in school-aged children. More specifically, we demonstrated that age explains a significant portion of variance of definitional skills (over listening comprehension), whereas definitional skills account for listening comprehension (in particular, textual comprehension). The present findings represent an original contribution to the relation between the implicit ability to comprehend oral texts, mastered by children at early ages, and the ability to define words, an advanced metalinguistic skill enhanced via formal education and reading activities.

The results of this study have potential implications for future work, especially in teaching and clinical activities. In the first case, the production of definitions could be applied to learning environments, for example school activities enhancing reflection on familiar words' meanings, or even by implementing specific training activities for a feasibility training study on definition productions). In the second

case, it could be useful to assess definitional skills in clinical settings, to explore idiosyncratic semantic fields or peculiar definitional styles, using semantic production tasks, other than the traditional ones (e.g., the vocabulary subtest of the Wechsler battery) limited to vocabulary size assessment, with less detailed coding systems and less apt to pinpoint specific morphosyntactic components and processes.

DECLARATION OF COMPETING INTEREST

None declared.

AUTHOR CONTRIBUTIONS

Caterina Artuso: conceptualization; formal analysis; writing – original draft.

Elena Torelli: data curation.

Carmen Belacchi: conceptualization; methodology; writing – review & editing.

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