Assessing early prosodic development in European Portuguese: the Proso-Quest parental report

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Universidade de Lisboa
Outline

- Proso-Quest (Frota, Vigário & Cruz 2012) – General features
- Method for collecting the 591 questionnaires (Vigário, Buttler & Correia 2013)
- Updated final results and discussion
- Concluding remarks
Proso-Quest (Frotta, Vigario & Cruz 2012) – general features

- Several instruments are available for assessing language development (CDI - Fenson et al. 2007; EP short form Frotta et al. 2015)

- Also for the assessment of prosody (PEPS-C - Peppé & McCann 2003; EP adaptation Filipe 2014)
Proso-Quest (Frota, Vigário & Cruz 2012)

– general features

Proso-Quest

- A questionnaire developed to assess infants’ prosodic skills;
- Age of application – children until 24 months old
- To be filled by parents or infants’ caregivers
- A single page, quick response questionnaire
- A unique tool for assessing early prosodic development
The analysis of the questionnaires collected provides a description of typical prosodic development in European Portuguese (comprehension and production) → reference values for prosodic development in Portuguese

Complements information from case studies of production (Frota et al. to appear) and comprehension.
Proso-Quest – General features

> Basic information about the child
  Name
  Date of birth
  Sex
> Date of questionnaire filling
> Short list of instructions
A. Comprehension – the child:

1. The child understands:
   - a statement, a question, a command, a request, a call
   - a word in isolation, at the end of a sentence, inside a sentence.
   - a specific object as opposed to others (contrastive focus context given)

### A. Comprehension – the child:

#### 1. A criança compreende:

<table>
<thead>
<tr>
<th>Idade (meses)</th>
<th>3</th>
<th>6</th>
<th>9</th>
<th>12</th>
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<th>18</th>
<th>Outro</th>
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<tbody>
<tr>
<td>uma afirmação</td>
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#### 2. A criança percebe melhor uma palavra se:

<table>
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<tr>
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</thead>
<tbody>
<tr>
<td>a palavra for dita isolada (ex.: a bolacha)</td>
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<tr>
<td>a palavra estar no fim da frase (ex.: olha a bolacha)</td>
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<tr>
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#### 3. A criança compreende quando se está a falar de um objecto específico em oposição a outros (ex: Num conjunto de brinquedos, a criança aponta para o livro, mas o adulto quer antes chamar a atenção para a bola e diz “a BOLLA”, de forma a mostrar que é com a bola e não com outro brinquedo que o adulto quer brincar):

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**A. Compreensão – the child:**

**1. A criança compreende:**

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<td>0</td>
</tr>
<tr>
<td>a palavra estiver no final da frase (ex.: olha a bolacha)</td>
<td></td>
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<td>0</td>
</tr>
<tr>
<td>a palavra estiver no meio da frase (ex.: a bolacha está aqui)</td>
<td></td>
<td></td>
<td></td>
<td>0</td>
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</table>

**+ Examples**
B. Production

the child:

. produces a statement, a question, a command, a request, a call

. produces mainly words in isolation; sequences of words but sounding as if each word is a sentence;

. produces sentences such that you know he/she is talking about an object as opposed to others
B. Produção

1. A criança produz:

<table>
<thead>
<tr>
<th>Idade (meses)</th>
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<tbody>
<tr>
<td>9</td>
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<tr>
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</tr>
<tr>
<td>uma afirmação</td>
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<tr>
<td>uma pergunta</td>
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<tr>
<td>uma ordem</td>
</tr>
<tr>
<td>um pedido</td>
</tr>
<tr>
<td>um chamamento</td>
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</tbody>
</table>

2. A criança produz:

<table>
<thead>
<tr>
<th>Idade (meses)</th>
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</thead>
<tbody>
<tr>
<td>12</td>
</tr>
<tr>
<td>-----</td>
</tr>
<tr>
<td>maioria das palavras é examinada (ex.: bebê)</td>
</tr>
<tr>
<td>sequência de palavras, mas parece que cada palavra é dita como se fosse uma frase (ex.: &quot;Bebê, bu ba, fu, fa, fiiu, fa fa fa fa...&quot;)</td>
</tr>
<tr>
<td>sequência de palavras juntas numa única frase (ex.: &quot;Bebê do ou, o bebê está a fazer ú ou...&quot;)</td>
</tr>
</tbody>
</table>

3. A criança, pela maneira como produz uma sequência, consegue mostrar que está a falar de um objecto diferente daquele que o adulto pensa (ex: o adulto pensa que a criança quer o livro e diz "Toma o livro", mas a criança responde "o BONECO!", significando com a maneira de dizer que não é o livro mas é o boneco que quer).

<table>
<thead>
<tr>
<th>Idade (meses)</th>
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<tbody>
<tr>
<td>12</td>
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</table>
Method
Vigário, Butler & Correia (2013)

- Procedure for collecting Proso-Quests extensively, in different regions of Portugal
  - Questionnaires distributed in kindergarten (most often, direct personal contact after telephone call)
  - Kindergarten staff helped in contacting parents, providing them general information, and collecting the forms filled out
  - Prepayed/prefilled postal packages provided, where forms were not collected by our staff/collaborators
  - Partial collection together with the CDI forms in various regions of Portugal
  - Proso-Quests also collected for every child participating in BabyLab’s experiments in the last two years
Method

- Exclusion criteria:
  - Insufficient data about the child (e.g. date of birth)
  - Several answers strikethrough/erased
  - Multiple answers
  - Same response across blocks (A, B, all) (often coinciding with the age of child at the time of response)
  - Bilinguals/multilinguals coded separately; excluded at this point

- Questionnaires collected

<table>
<thead>
<tr>
<th>Total</th>
<th>591</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excluded</td>
<td>79</td>
</tr>
<tr>
<td>Partially excl</td>
<td>121</td>
</tr>
<tr>
<td>Bilinguals/ Multilinguals</td>
<td>83</td>
</tr>
<tr>
<td>Included</td>
<td>429</td>
</tr>
</tbody>
</table>
Results and Discussion

The child understands/produces Call, Stat, Com, Quest, Req

- **Utterance types**

  **Comprehension**
  - All types understood between 9mo~13mo
  - Call > Stat > Req, Com, Quest,

  **Production**
  - All types produced between 14-18
  - Call > Stat > Req > Com, Quest

Comprehension precedes production: the latest category in comprehension precedes the earliest category that is produced 
\( F(1,333) = 797.09, p < .001, \eta^2 = .71 \)

Significant interaction between comprehension/production and type 
\( F(4,1322) = 10.63, p < .001, \eta^2 = .03 \)
Results and Discussion – Utterance types

Distribution of responses

- Call
- Stat
- Com
- Quest
- Req

Very close relation between the results from comprehension and production

L productions (Frota et al. to appear) ~ Proso-Quest results (Prod)
- All these sentence types documented in L productions at 13mo;
- L within 25th-50th

~ L: Stat, Req (Com) > Call, Quest ~ Proso-Quest: Call>Stat>Req>Com, Quest
Results and Discussion

The child understands better/produces mainly isolated words, words in final position, integrated words

- **Words in context**
  
  **Comprehension**
  - Prominent positions facilitate word comprehension
  - Preference for isolated words (10mo) > final position favors comprehension (12mo) > words inside sentences understood at ~13mo

  **Production**
  - Prosodic integration occurs late
  - Isolated Wds (14-15mo) > Wrd sounds like sentence (16-17mo) > Words integrated in the sentence (18-19mo)

Comprehension precedes production: latest category in comprehension precedes earliest category that is produced ($F(1,328) = 732.49, p < .001, \eta^2 = .069$)

Significant interaction between comprehension/production and type ($F(2,656) = 4.89, p < .01, \eta^2 = .02$)
Results and Discussion
– Words in context

- Distribution of responses

✓ Very close relation between the results for comprehension and production

✓ Proso-Quest results (Prod) ~ L productions (Frota et al. to appear)

<table>
<thead>
<tr>
<th>Word</th>
<th>[Word Word]</th>
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<tbody>
<tr>
<td>L</td>
<td>21mo</td>
</tr>
<tr>
<td>22mo</td>
<td></td>
</tr>
<tr>
<td>Proso-Quest</td>
<td>~80th</td>
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<tr>
<td>~85th</td>
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</tbody>
</table>
Results and Discussion
– Focus

Focus

Comprehension
Focus reported to be understood at 13

Production
Focus reported to be produced at 18

Comprehension precedes production
\[(F(1,393) = 542.22, \ p < .001, \ \eta^2 = .58)\]
Results and Discussion

– Focus

Distribution of responses

✓ Very close relation between the results for comprehension and production

✓ L productions (Frota et al. to appear) ~ Proso-Quest results (Prod)
  
<table>
<thead>
<tr>
<th>Production of focus</th>
<th>L within 10th-25th</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proso-Quest</td>
<td>10th-25th</td>
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</tbody>
</table>
Results and Discussion
– Reliability of Proso-Quest

- Reliability measured using Cronbach´s coefficient alpha
  a measure of internal consistency, that is, how closely related a set of items are as a group (above .8 is generally considered acceptable, e.g. Fenson et al., 2000)
  The coefficient was .93. → therefore reliable measure of comprehension/production

- Partially excluded responses: seems fairly evenly spread across Part 1 and Part 2 – no reason to believe some questions more difficulty than others
Results and Discussion – by gender (Comprehension)

Female (N=211), Male (N=219)

Utterance types – no differences
Words in context – no differences
Focus – no differences
Overall – no differences
Results and Discussion — by gender (Production)

Female (N=211), Male (N=219)

- Utterance types – no differences
- Words in context – no differences
- Focus – no differences
- Overall – no differences
Comparing gender

- Overall
  - no statistical differences in Comprehension
  - no statistical differences in Production
Results and Discussion
– Age of the child at the moment of parents’ report and response distribution (comprehension)

Groups Younger less than 20m (N=13), Older more than 25m (N=187) compared to 20-25m (N=229)

Utterance types – no differences
Words in context – no differences
Focus – Significant difference between 20-25m and older (t(403) = 2.06, p < .05)
Overall – no differences
Results and Discussion

– Age of the child at the moment of parents’ report and response distribution (production)

Groups Younger less than 20m (N=13), Older more than 25m (N=187) compared to 20-25m (N=229)

Utterance types - Significant difference between 20-25m and older (t(414) = 4.92, p < .001)
Significant difference between younger and older (t(198) = 3.39, p < .001)

Words in context - Significant difference between 20-25m and older (t(414) = 2.94, p < .01)
Significant difference between younger and older (t(198) = 2.12, p < .05)

Focus - No differences

Overall - Significant difference between 20-25m and younger (t(240) = 2.5, p < .05)
Significant difference between 20-25m and older (t(414) = 4.75, p < .001)
Significant difference between younger and older (t(198) = 3.37, p < .01)
Comparing age groups

- For **comprehension**, difference between 20-25m and older group for Focus only. Older group judged earlier.

- For **production**, utterances types and words and contexts judged later for older group than 20-25m (and older later than younger). Overall, older judged later than 20-25m, while younger judged earlier than both.
Results and Discussion

– Age of the child at the moment of parents’ report and parents’ level of education in excluded reports

- Mean excluded questionnaires filled out when child was 26 months 11 days old (vs mean values for the forms included 26 months) – no significant difference (F1(484)<1)
  → Age of the child at the moment of parents’ report does not seem to explain excluded reports

- Parents’ level of education in excluded questionnaires
  43% highly qualified, 38% medium qualified, 6% low qualified and workers, 13% unemployed
  No indication that a high level of education is required in order for parents to be able to fill out Proso-Quest
Results and Discussion

– Results by region

Lisboa (N=138), Norte (N=140), Centro (N=82), Alentejo (N=27), Algarve (N=20), Ilhas (N=22)

Utterance types – Significant difference between Lisboa and Algarve ($t$(156) = 2.11, $p < .05$)

Words in context – No differences

Focus – Significant difference between Lisboa and Norte ($t$(268) = 3.18, $p < .01$) and Lisboa and Alenjejo ($t$(160) = 2.04, $p < .05$)

Overall – Significant difference between Lisboa and Alentejo ($t$(163) = 1.94, $p = .05$) and Lisboa and Algarve ($t$(156) = 1.94, $p = .05$)
Results and Discussion
– Results by region

Lisboa (N=138), Norte (N=140), Centro (N=82), Alentejo (N=27), Algarve (N=20), Ilhas (N=22)

Utterance types – Significant difference between Centro and Ilhas $(t(102) = 1.99, p < .05)$ and almost significant difference between Lisboa and Centro $(t(218) = 1.76, p = .06)$

Words in context – no differences

Focus – Significant differences between Lisboa and Norte $(t(257) = 3, p < .01)$ and Lisboa and Centro $(t(207) = 2.36, p < .05)$

Overall – Significant difference between Lisboa and Norte $(t(276) = 2.51, p < .05)$, Lisboa and Centro $(t(218) = 2.65, p < .01)$, Norte and Ilhas $(t(160) = 2.27, p < .05)$ and Centro and Ilhas $(t(102) = 2.88, p < .01)$
Comparing regions

- Globally, there is some variation across regions for both comprehension and production but clearly the same general tendencies
Concluding remarks

- The results obtained seem to be reliable
- According to parental reports, comprehension precedes production in all prosodic skills under evaluation
  (a delay of ~5 months in average in all parameters)
- Chronology of sentence type emergency in comprehension and production: very similar
  Compreh.: Call > Stat > Req, Com, Ques
  Product.: Call > Stat > Req > Com, Quest
Concluding remarks

- In average, all types of sentences are reported to be understood and produced within a 4 months window, respectively (9-13 and 14-18, respectively)
- Prosodic breaks are reported to facilitate word comprehension early on (10-12mo)
- Prosodic breaks between words also reported in first stages of word production: words firstly produced in isolation; combinations of words first sound as if each word is a sentence; prosodic integration only occurs later (18-19mo in average)
- Focus is understood by 13 mo and produced by 18mo in average
Concluding remarks

- We have collected a norm sample of 429 valid parental questionnaires.
- Provides reference values for prosodic development in Portuguese.
  → Clinical applications - Screening and assessing typical/deviant linguistic (prosodic) development.
- Also very useful information for research on language and prosodic development.
Concluding remarks

- Future work
  - How do the results of Proso-Quest (prosodic development questionnaire) relate to the results of CDI (lexical development questionnaire)?
  - How do the results of Proso-Quest relate to other areas of language development?
  - How do the results from the parental reports compare with what is actually observed in comprehension and production studies of child language?
Concluding remarks

Future work

- Determine the optimal age of the child for the questionnaire to be filled
- Apply Proso-Quest for children with atypical development (e.g. Down Syndrome, Autistic)
Acknowledgements

We are grateful to all the parents who filled out the questionnaire, as well as the staff of nurseries/kindergartens and several collaborators, including in particular Filomena Silva, from Botãozinho, and Cláudia Bandeira Lima, for their help in questionnaires’ collection.

DEPE: PTDC/CLE-LIN/108722/2008, FCT
EBELa: EXCL/MHC-LIN/0688/2012, FCT

http://labfon.letras.ulisboa.pt/babylab/pt/CDI/