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## Investigating language acquisition disorders based on the complaints

### *Investigando os distúrbios de aquisição de linguagem a partir das queixas*

### ABSTRACT

**Purpose:** To investigate complaints commonly reported by parents of children with language disorders. In addition, we have analyzed the conditions of verbal production and comprehension of these children. **Methods:** The sample comprised 55 children of both genders with ages between 2 and 12 years old. The complaints reported by their families at the beginning of therapeutic intervention were analyzed and subdivided, considering deficits on verbal production, verbal comprehension and both (mixed comprehension and production deficits). Subsequently, we analyzed the performance of these children in verbal comprehension and production tests, in phonological, semantic, grammatical and pragmatic levels. **Results:** By analyzing the performance of children whose families complained about verbal production (82.6%), it was found that 55.2% of them also presented verbal comprehension deficits. Verbal production deficits occurred at phonological (97.3%), semantic (76.3%), grammatical (78.9%) and pragmatic (5.2%) levels. **Conclusion:** Although complaints regarding verbal production deficits are more common, verbal comprehension deficits are also evident in children with language disorders. These findings evidence the importance of careful evaluation based on the complaints presented by the families.

### RESUMO

**Objetivo:** Investigar as queixas comumente relatadas por pais de crianças com Distúrbio de Linguagem. Além disso, buscou-se analisar as condições de recepção e expressão verbais destas crianças. **Métodos:** A amostra foi constituída por 55 crianças, na faixa etária entre 2 e 12 anos, de ambos os gêneros. As queixas relatadas pela família no início da intervenção terapêutica foram analisadas e subdivididas, considerando-se prejuízo de produção verbal, compreensão verbal e misto (compreensão e produção). Posteriormente, foram analisados os desempenhos das crianças em provas de compreensão verbal e produção nos níveis fonológico, semântico, gramatical e pragmático. **Resultados:** Ao analisarmos o desempenho de crianças cujos familiares apresentavam queixa quanto à produção verbal (82,6%), observamos que 55,2% delas também apresentavam desvios na compreensão verbal. O comprometimento da produção verbal ocorreu em nível fonológico (97,3%), semântico (76,3%), gramatical (78,9%) e pragmático (5,2%). **Conclusão:** Embora a queixa sobre prejuízos na produção verbal seja mais mencionada pelos familiares, os prejuízos na compreensão verbal também são evidenciados em crianças com Distúrbio de Linguagem. Esses achados confirmam a importância da realização de uma avaliação cuidadosa a partir da investigação da queixa relatada pelas famílias.

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## INTRODUCTION

The family and caregivers' perspective, in terms of adverse conditions which may jeopardize the process of infant speech acquisition and development, must always be valued. It is important that parents are able to detect and understand any atypical manifestations in their children's development<sup>(1,2)</sup>. Care towards parents, either providing them with precise information on the child's development, or welcoming their doubts and worries, is a crucial and intrinsic task of speech treatment practice<sup>(3-7)</sup>.

The complaint consists of the initial reason which motivates the family to search for specialized treatment. It is the root of the speech therapist's clinical induction and investigation, in search of the diagnosis<sup>(3-7)</sup>. However, in order to reach diagnostic precision, it is necessary that the professional should be attentive not only to the reported complaint, but also to the child's clinical manifestations.

Around 80% of complaints reported by parents of children with different development disorders are related to the absence or inadequacy of speech<sup>(1,2)</sup>. The language model of *input-process-output*, or *bottom-up*, is quite useful in the analysis of these conditions, as it allows the evaluation of the integration of the abilities of verbal reception and production<sup>(1)</sup>.

We know that language is a random set of codified auditory signs and/or gestures, developed in order to make interpersonal communication possible. It plays a central role in thought organization and expression, and can be codified, instructively, into four levels: phonologic (when speech intelligibility and precision of articulation are taken into account); grammatical (verbal production rules whose evaluation congregates morphological and syntactical analyses); semantic (lexical repertory) and pragmatic (rules which govern the intentionality and functionality of speech)<sup>(1-3,6)</sup>. The *input-process-output* model applies to each of the four levels of language. What must be taken into account is that during the entire period of infant speech acquisition and development, the *input* disorders will always harm subsequent language operations. Therefore, *input* disorders are seen in younger children as mixed disorders of reception and expression, in contrast to *output* disorders, which can exist isolated<sup>(1,2)</sup>.

Although the most commonly reported complaints by families are directly related to a speech impediment, the hypothesis considered in this study is that, very often, there is also an alteration in verbal comprehension. This occurs because a potential disorder in the *input* can jeopardize subsequent language operations, causing mixed disorders of verbal reception and expression.

The objective of this study was to investigate commonly reported complaints by parents of children with Language Acquisition Disorder. Besides this, the conditions of verbal reception and expression of these children were analyzed.

## METHODS

The study was of a retrospective nature, and was approved by the Committee of Research Ethics of Universidade Federal

de São Paulo – UNIFESP (CEP nº 1866/09). The parents or guardians were aware of the methodological procedures, and signed the Term of Free and Informed Consent.

## Sample

The sample consisted of 55 children, out of which 36 (65%) were of the male gender, and 19 (35%), female. All children were between the ages of two and 12 years, and diagnosed with Language Acquisition Disorder. They were treated by direct and indirect intervention at the Laboratory of Language and Speech Therapy of the Department of Speech-Language Pathology and Audiology of UNIFESP, in the period between March 2004 and March 2009.

All children were regularly enrolled in primary or middle education institutions and in possession of auditory perimeters compatible with normal standards. Out of the 55 children, 49 were considered verbal (they were capable of producing words or phrases constituted by at least 75% of the sounds existent in Portuguese)<sup>(8)</sup>, and six were considered non-verbal (they emitted only vocalizations during the initial moment of language evaluation, which preceded the intervention period).

The criteria of inclusion adopted were: age; presence of complaint, by family, related to an alteration in oral communication, reported in the initial period of treatment (anamnesis); confirmation of the multidisciplinary diagnosis of Language Acquisition Disorder during the process of language evaluation.

Comorbidity was considered an exclusion criterion in the cases of: motor, auditory or visual deficiency, and/or associated genetic syndromes.

## Procedures

The complaints reported by family members during anamnesis were divided between:

- a) impairments in verbal production: characterized by difficulties in oral emission. This category of complaints was subdivided into: absence of speech, hardly any speech, and incorrect speech.
- b) impairments in verbal comprehension: characterized by difficulties in understanding simple and/or complex verbal orders.
- c) mixed impairments of verbal comprehension and production: characterized by difficulties in verbal emission and comprehension.

Other complaints mentioned by families, such as attention deficit (for example: "is inattentive"), agitation (for example: "is restless"), and academic difficulties (for example: "doesn't learn", "has difficulties at school") were not considered in this study.

Later, the children's performance in verbal comprehension tests was analyzed on the following levels: phonologic, semantic, grammatical and pragmatic, during the initial period of language evaluation which precedes the process of speech and language therapy intervention. For the evaluation of verbal comprehension, simple and complex verbal orders were to be executed by the child, according to Braz and Pellicciotti's proposal<sup>(9)</sup>.

For the evaluation of verbal production, the following were used:

- Phonological level – Phonology task of the ABFW test<sup>(10)</sup>. It consists of 73 figures which must be named and/or repeated by the child and whose verbal production involves all the sounds of the Portuguese.
- Semantic level – Vocabulary task of the ABFW test<sup>(10)</sup>. Consists of the naming of vocables from figures subdivided into nine conceptual fields.
- Grammatical level – Logical-Temporal Sequences<sup>(11,12)</sup> which involve 15 day-to-day scenes. Each one is composed of four figures which must be ordered so that a story can be constructed. After sorting the scenes, the child is encouraged to narrate them. All the narrations are transcribed and analyzed according to the following grammatical indicators: use of phrasal construction, time markers, pronouns, plurals, possessive markers and articles.
- Pragmatic level – Pragmatics task of the ABFW test<sup>(10)</sup>, whose objective is to evaluate the functionality of communication by way of behavioral observation in relation to the playful situation.

All answers obtained in the tests were analyzed and converted into adequate or inadequate performances. Performance was considered inadequate in the following situations: child showed difficulty when executing verbal orders, or there was the presence of phonetic exchanges no longer expected at such an age; index of expressive vocabulary was below the expected for the age; grammatical mistakes in narrative productions; use of communicative functions with indices below the parameters considered appropriate for the age in question. For the analysis of the results, we considered the types of complaints and the analysis of the performance of the children on the levels mentioned above.

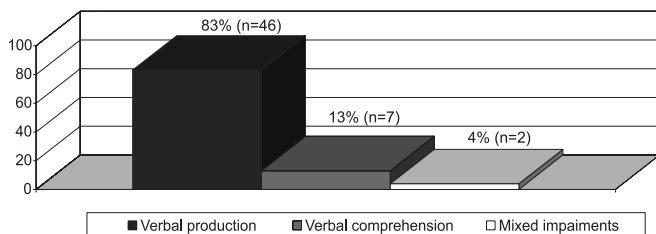
**Statistical method**

The statistical analysis was carried out by the Test of Equality of Two Proportions (non-parametric). The level of significance adopted was 0.05 (5%).

**RESULTS**

The results show the types of complaint reported by family members (Figure 1).

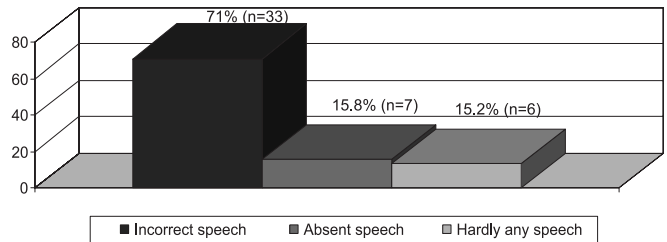
It was observed that 83% of complaints (n=46) were related to the observation of difficulties in verbal production, 13% (n=7) to deficits in verbal comprehension, and only 4% (n=2) to mixed impairments.



**Figure 1.** Complaints referred by parents

were related to the alteration which involved both production and verbal comprehension (mixed complaint).

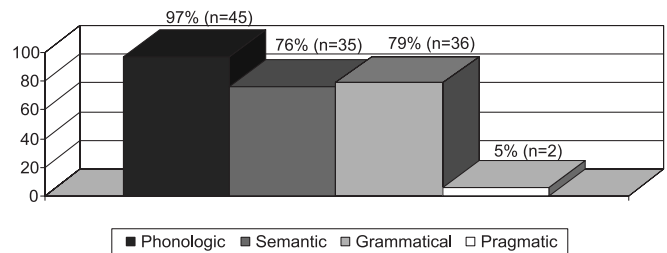
Complaints related only to verbal production were subdivided into: “absence of speech”, “hardly any speech” and “incorrect speech” (Figure 2).



**Figure 2.** Types of complaints of verbal production

It was noted that 71% of complaints relating to verbal production referred to incorrect speech (n=33), 15.8% to absence of speech (n=7) and 13.2% to hardly any speech (n=6).

The results show the distribution of verbal impediments in children with complaints of verbal production, according to the levels (Figure 3).

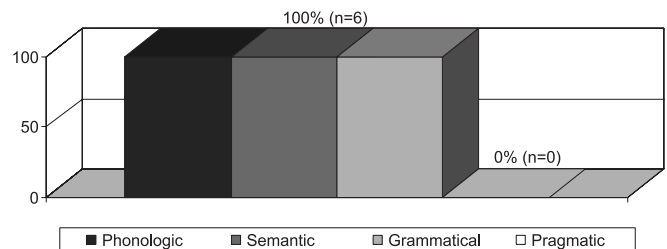


**Figure 3.** Levels of the verbal comprehension disorders in children with verbal production complaints

Of the total number of children with complaints solely related to verbal production (n=46), 55.3% showed impediments in verbal comprehension at the time of the language evaluation (n=25). There was no difference between this index and the percentage of 44.7% of children (n=21) with the same type of complaint and preserved verbal comprehension (p=0.359).

The analysis of levels of verbal impediments of the seven children with complaints solely referring to verbal comprehension was also carried out (Figure 4).

It was observed that all children presented impairment on levels of phonology (100%), semantics (100%), and grammar (100%), and no impediments on the pragmatic level.



**Figure 4.** Levels of verbal production disorders in children with complaints in verbal comprehension

Both children presenting mixed complaints or, in other words, with difficulties both in verbal production and comprehension, showed impairments on the levels of phonology (100%), semantics (100%) and grammar (100%) during the process of language evaluation. Performance below parameters of normalcy on the Pragmatic level (50%) was observed in only one of them.

## DISCUSSION

The hypothesis considered in this study is that, although the most commonly reported complaints by parents and caregivers of children with Language Acquisition Disorder are related to speech impediments, flaws in verbal comprehension can also be identified in these children. This is justified because a potential disorder in the *input* can jeopardize subsequent language operations, causing mixed disorders of verbal reception/expression<sup>(1-3)</sup>. To such an end, we investigated the complaints reported by parents and caregivers of children with Language Acquisition Disorder and, later, evaluated the impairments manifested in terms of verbal reception and expression.

In the analysis of the results, we observed that, in the characterization of the sample, there was a prevalence of the male gender over the female. Although there are no epidemiological researches, especially concerning the Brazilian population, several studies have pointed towards a preponderance of speech impediments in boys<sup>(13-18)</sup>.

There are many explanations for the existence of a difference in linguistic performance between boys and girls: brain development (biological factors), testosterone levels (hormonal factors), and the demands of the social environment (social factors)<sup>(18)</sup>. Besides this, it is known that boys are more vulnerable to impacts which can jeopardize infantile development<sup>(19)</sup>.

When analyzing the types of complaints, we noticed that there was a prevalence of those referring to verbal production, in comparison with mixed ones and with complaints relating to verbal comprehension. These facts show that verbal production is in truth a marker of essential infantile development. It is not only a parameter for normalcy, but also an index of prognosis when the child transgresses the speed and extension of acquisition of this behavior.

By detaining ourselves in the description of this type of complaint, related to verbal production, we notice that “incorrect speech” had the greatest number of occurrences, over “absence of speech” or “hardly any speech. Various studies concerning the reason which mobilizes families to search for language treatment indicate that the most common complaint refers to impediments in verbal production, such as “incorrect speech” or “absence of speech”<sup>(17-22)</sup>.

In the analysis of the levels of impediment among children who presented complaints relating to verbal production, we verified that the damage was greater on the phonological level, although semantic, grammatical and pragmatic alterations also occurred. Phonology deals with a structural aspect of Language, while semantics is, in general, considered a conceptual aspect. Although the relationship between them might not be very apparent, many investigations have shown that certain semantic

factors influence phonetic precision<sup>(23-25)</sup>. Therefore, pragmatic, semantic, morphosyntactic and phonological aspects cannot be considered separately, for they act together in the development of linguistic abilities<sup>(25-29)</sup>.

Another critical fact which must be emphasized refers to the *input-process-output* model, or *bottom-up* model, which allows us to evaluate the integration of the abilities of verbal reception and production<sup>(1-3,27)</sup>. When analyzing the performance of children who presented initial complaints related solely to verbal production, we ascertained that over half of them also showed impediments in verbal comprehension tasks.

The opposite course also occurred. Of the seven children who presented initial complaints relating to impediments in verbal comprehension, all presented disabilities on the levels of phonology, semantics and grammar. As such, the hypothesis we considered in this study was confirmed. Although the most commonly reported complaint by parents and caregivers of children with development disorders is related to speech impediments, flaws in verbal comprehension could also be identified. This is probably due to a potential disorder in the *input*, which might have jeopardized subsequent language operations, causing mixed disorders of verbal reception/expression<sup>(1-3,27-30)</sup>.

Only two children presented mixed complaints and both showed impediments on the phonological, semantic and grammatical levels. These facts lead us to reflect on the importance of the caring eye in relation to the communicative performance of children, especially when they transgress or violate the parameters of typical development.

We believe, more still, in the appreciation of the family and caregivers’ perspective in relation to the child, especially in terms of the complaint. This aspect must be considered, as it is this reason which motivates the family to search for specialized treatment, and becomes the first step in the professional’s clinical reasoning and diagnosis.

## CONCLUSION

Although the complaint relating to verbal production is the most frequent among family members, impediments in verbal comprehension can also be seen in children with Language Disorder. These results confirm the importance of undertaking a careful evaluation, based on the investigation of the complaint reported by families.

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