

The Relationship Between Speech and Language Problems and the Outcomes of Language Tests

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Abstract

Objectives: Language tests are performed in order to detect a possible language disorder in children and to determine whether its cause is auditory, receptive, expressive, or an overall problem. The aim of the present study is to investigate the effect of different language and speech problems on language.

Methods: A total of 41 children between the ages of 2 and 6 years old (mean age: 3 years and 8 months), consisting of 27 males and 14 females, were evaluated. Children were distributed into 5 groups according to the types of their problems: Group I- Listening disorder; Group II- Attention deficit; Group III- Attention deficit/hyperactivity; Group IV- Speaking previously but quitted; and Group V- Delayed speech. The Receptive and Expressive Language Test was applied to all groups.

Results: Its results showed that the language development of most children in the listening disorder group was normal. Only 2 children had delayed development of expressive language. There were personal differences in language development among the children with attention deficit, some had delayed receptive language, some had delayed expressive language, and some had both. The language profile of participants with Attention Deficit Hyperactivity Disorder (ADHD) was similar to those who had been speaking previously but quitted later. There was mixed receptive-expressive language delay in both groups. Among 10 children with speaking delay, only 2 of them had expressive delay while 8 had receptive-expressive delay.

Conclusion: As a conclusion, the language test outcomes were concordant with the type of language and speaking disorder. In some children, the language and speech problems could have been prevented if they had referred earlier for a language testing.

Keywords: Language test, receptive and expressive language, children

Konuşma ve Dil Problemleri ile Dil Testi Sonuçları Arasındaki İlişki

Özet

Amaç: Dil testleri, çocuklarda muhtemel dil bozukluklarını tespit etmek ve sebebin işitsel, alıcı, ifade edici ya da genel bir problem olduğunu belirlemek için yapılır. Bu çalışmanın amacı, farklı dil ve konuşma sorunlarının dil üzerindeki etkisini araştırmaktır.

Metod: 2 ve 6 yaş arasındaki (ortalama yaş eski: 3 yıl ve 8 ay) toplam 41 çocuk (27 erkek ve 14 kız) değerlendirildi. Çocuklar sorunlarının türlerine göre 5 gruba ayrıldılar: Grup I-Dinleme bozukluğu Grup II-Dikkat eksikliği; Grup III-Dikkat eksikliği / hiperaktivite, Grup IV-Daha önceden konuşup şu anda problemi olanlar, Grup V- Konuşma Gecikmesi. Tüm gruplara, alıcı ve ifade edici dil testi uygulandı.

Bulgular: Bu sonuçlar, dinleme bozukluğu grubundaki çocukların çoğunun dil gelişiminin normal olduğunu gösterdi. Sadece 2 çocukta ifade edici dil gelişiminde gecikme vardı. dikkat eksikliği olan çocuklar arasında dil gelişimi açısından kişisel farklılıklar vardı, bazılarında alıcı dil gecikmesi, bazılarında ifade edici dil gecikmesi vardı; bazılarında herikisi de bulunmaktaydı. Dikkat Eksikliği Hiperaktivite Bozukluğu (DEHB) olan katılımcıların dil profili, önceden konuşup şu anda problemi olanlara benzerlik gösteriyordu. Her iki grupta da karışık alıcı-ifade edici dil gecikmesi vardı. Konuşma gecikmesi olan 10 çocuk arasında, sadece 2 tanesinde ifade edici dil gecikmesi vardı, 8 tanesinde ise alıcı-ifade edici dil gecikmesi bulunmaktaydı.

Sonuç: Sonuç olarak, dil test sonuçları, dil ve konuşma bozukluğunun tipi ile uyumludur. Bazı çocuklarda, dil ve konuşma problemleri, eğer daha erken dönemde dil testi için yönlendirilirlerse önlenilmektedir.

Anahtar kelimeler: Dil testi, alıcı ve ifade edici dil, çocuklar

Introduction

Speech and language problems do not constitute a single clinical entity or unitary concept. They are a group of developmental disorders with multiple causes, varying significance, and marked associations with other developmental impairments. Problems of language acquisition are among the commonest developmental impairments found in pre-school children. Its exact prevalence varies, depending on the definition used and the population studied. The generally accepted range is between 3% and

10%, although a much smaller proportion of these regard severe and persistent problems. In assessing the significance of a speech and language problem at any moment in time, the clinician needs to consider the age, severity, and over-time consistency of the problem¹.

Language evaluation reflects children's problematic backgrounds². The language test can be used to detect a possible language disorder in the child and, if confirmed, to determine whether its source is auditory, expressive, or an overall

problem. It also assists in establishing the severity degree and identifying areas for in-depth testing before defining therapy goals³. Many children identified as having language-based learning problems (LP) also had difficulties in encoding auditory inputs, such as rapidly changing acoustic cues^{4,5}. Auditory-based or language-based LP are quite frequent. Children with specific language impairment (SLI) have auditory processing difficulties, which is a developmental language disorder. It can affect both expressive and receptive languages^{6,7}. Some children with poor performance on the auditory processing disorder (APD) assessment battery, do not evidence any speech or language problems. Contrarily, a number of children with APD do have significant speech or language difficulties. The diagnosis is very complicated since other types of childhood disorders may exhibit similar behaviors⁸. Speech sound disorders show a slowed rate of speech acquisition, but children often follow a relatively typical sequence of sound development⁹.

In general, a child is considered to have speech delay if his/her speech development is significantly below the norm for that age. This means that the speech development is equivalent to that of a normally developing child but at a younger chronologic age; the skills are acquired in a normal sequence, but at a slower-than-normal rate^{1,3}. Shriberg et al's¹⁰ estimated the incidence of speech delay based on a demographically representative sub-sample of 1328 monolingual, English-speaking 6-year-old children. The 6 major findings were: 1) the prevalence of speech delay was 3.8%; 2) speech delay was 1.5 times more prevalent in boys than girls; and 3) the speech delay and language impairment comorbidity was 1.3%.

The nature of Attention Deficit-Hyperactivity Disorder (ADHD), as described in the Fourth Edition of the Diagnostic and Statistical Manual [DSM-IV, American Psychiatric Association, 1994] indicates a potential association with language disorder. These children are often described as "not listening" rather than "not hearing" by their parents. The physician should be concerned if the child is not babbling by the age of 12 to 15 months, not comprehending simple commands by the age of 18 months, not talking by the age of 2, not making sentences by the age of 3, or having difficulty telling a simple story by the age of 4 to 5 years old¹¹. It is a challenge to reliably detect language disorders in very young children¹². However, when identified in later preschool years, they show high rates of persistence^{13,14}. In fact, the main criterion for the disorder diagnosis is a language performance below the expected levels for the child's age on

standardized tests and/or spontaneous measures of language ability. In addition to identifying a child who does not have similar performance to his/her peers and determining whether the disorder is primarily receptive or expressive, a clinician can use the language test results also to acknowledge whether the child is exhibiting a delay across all or specific language areas³. The language test is extremely important to disclose the nature of the disorder and establish the diagnosis².

There is an enormous variation in the rate of language acquisition. Furthermore, children assessed as being 'delayed' at one point in life, may be within normalcy 2 years later; the converse also applies. Not surprisingly, those children with the most severe delay in language development also display the most persistent and stable problems. Many clinicians make a distinction between language delay and language disorder. In this case, the term 'disorder' implies an abnormal development pattern not usually seen in the normal language acquisition process, while 'delay' implies language acquisition proceeding along normal lines, but more slowly than expected¹.

In the present study, the Receptive and Expressive Language Test was applied to children with language and speaking disorders¹⁵. The relationship between the language test results and the disorders was evaluated.

Materials and Method

The study was conducted in Hacettepe University, Hearing-Speech Department. All steps of the study were planned and continued according to the principles outlined in the Declaration of Helsinki¹⁶.

In the present study, children admitted to the Hacettepe University, Hearing-Speech Department with the complaints of language and speech problems were evaluated. Forty-one children were included into the study. Their mean age was 3 years and 8 months old (range: 2 years-1 month and 5 years-9 months). There were 27 boys and 14 girls. All of them underwent audiologic tests, appropriate to their ages, and those with normal bilateral hearing were selected. Additionally, the Denver II¹⁷ test was performed to evaluate the children's overall development. 41 children with both normal Denver II and audiologic tests were included in the study.

They were distributed into 5 groups according to their complaints: Group I-Listening disorders, Group II- Attention deficit, Group III- Attention deficit/hyperactivity, Group IV-Previously speaking, quitted later and Group V- Delayed speaking (Table I).

Their medical histories revealed no maternal illnesses during intrauterine period. There were

not a history of perinatal trauma, infection or asphyxia; ototoxic drug usage and family history of significant illnesses. They had normal gestational age at birth, birth weight and past health.

Instrumentation:

Receptive and Expressive Language Test: The receptive and expressive language level of each child was assessed via Turkey Preschool Language Scale, Fourth Edition (TPLS-4) (15) test. It consists of two subscales: Auditory Comprehension (AC) and Expressive Communication (EC). The AC subscale evaluates a child's ability to understand spoken language. Sixty-two AC tasks and 68 expressive communication tasks make up the total scale, and each may include one or more sub-items. Administration time varies, depending on the child's age and his/her cooperation during the test (mean: 20-45 min). Response scoring was as follows: passing an item required a score of "1" and not passing, a score of "0." Scores of "1" were summed for each subscale to yield an AC and an EC raw score. This study used the age equivalents. A language development level equal to or above the expected for the specific chronologic age was accepted as "normal", and otherwise as "delayed" for all groups of I to V.

The Receptive and Expressive Language Test was applied to all groups (Groups I-V) and the results were evaluated. All children in the study and control groups were included into the study with their parents' agreement by written informed consent to participate the study, and to give permission for the use of their children's all data.

Results

Table II shows differences in receptive and expressive language performances in all groups.

In Group I: The results of Receptive and Expressive Language Test revealed that the language development of most group members with listening disorder was normal. Delay in expressive language development was observed in only 2 children (Table III).

In Group II: The results of Receptive and Expressive Language Test revealed that children with attention disorder had differences in language development. Of 3 children, 1 had delay in receptive language development and 1 had delay in expressive language development. Both delays were verified in the third child (Table IV).

In Groups III and IV: Mixed receptive-expressive language delay was found in all of the children with ADHD and who had previously spoken, but

gave up later. Their language performances were similar (Tables V and VI).

In Group V: Expressive delay was detected in only 2 of the 10 children in the speech delay group, whereas both receptive and expressive language delay was found in 8 children (Table VII).

Table I. Children complaints

Group I	Listening disorders
Group II	Attention deficit
Group III	Attention deficit/hyperactivity
Group IV	Previously speaking, quitted later
Group V	Delayed speaking

Table II. Results of Auditory Comprehension (AC) and Expressive Communication (EC) according to each group's disorder

	Normal receptive and expressive language developments in 20 of 22 children.
Group I	Expressive language delay in 2. Receptive and expressive language delays in 1 of 3 children. Receptive language delay in 1 child. Expressive language delay in 1 child.
Group II	Receptive and expressive language delays in all children.
Group III	Receptive and expressive language delays in all children.
Group IV	Expressive language delay in only 2 (twin girls) of 10 children. Receptive and expressive language delays in 8 children.

Table III. Language test results of children with listening disorder

Case	Sex	Years	Months	AC: Age	EC: Age	Results
1	M	3	5	3:6-3:11	3:6-3:11	Normal
2	M	5	4	4:0-4:5	5:0-5:5	Normal
3	M	4	7	4:6-4:11	4:6-4:11	Normal
4	M	5	10	5:6-5:11	5:6-5:11	Normal
5	M	4	2	4:0-4:5	4:0-4:5	Normal
6	M	5	1	4:6-4:11	5:0-5:5	Normal
7	M	5	9	5:6-5:11	6:0-6:11	Normal
8	M	5	11	6:0-6:5	6:6-6:11	Normal
9	M	3	9	4:0-4:5	3:6-3:11	Normal
10	M	3	8	4:0-4:5	4:6-4:11	Normal
11	F	3	7	5:0-5:5	5:6-5:11	Normal
12	F	4	11	4:6-4:11	4:0-4:5	Normal
13	F	3	5	3: 0-3:5	3: 0-3:5	Normal
14	F	3	9	3: 0-3:5	1:6-1:11	Normal
15	F	4	10	4:6-4:11	4:6-4:11	Normal
16	F	4	2	4:6-4:11	4:6-4:11	Normal
17	F	4	9	4:6-4:11	4:6-4:11	Normal
18	M	3	7	3:6-3:11	3:6-3:11	Normal
19	F	2	6	2:6-2:11	2:0-2:5	Normal
20	F	3	8	3:6-3:11	3:0-3:5	Normal
21	M	5	1	3:6-3:11	2:0-2:5	Expressive Delay
22	M	2	4	2:0-2:5	1:6-1:11	Expressive Delay

Table IV. Language test results of children with attention deficit

Case	Sex	Years	Months	AC: Age	EC: Age	Results
23	F	3	8	2:6-2:11	2:0-2:5	Receptive-Expressive Delay
24	F	3	8	4:0-4:5	2:6-2:11	Expressive Delay
25	M	3	11	3:0-3:5	4:0-4:5	Receptive- Delay

Discussion

Characterization of child language provides clinicians with a deeper understanding of the linguistic deficits of many of the children within heterogeneous population. Language tests demonstrate the effect of the true nature of the problem on both the area of receptive and/or expressive language.

The diagnosis of language problems remains complicated. This may be related to similar behaviors displayed toward different types of childhood disorders. They are simply considered as comorbid. Thus, no difference can be observed in the language tests. Test performance is often influenced by non-auditory factors (e.g., language, memory, motivation lack of sustained attention, and lack of cooperation). In this study, we tried to look for the answer of the question: if the threshold of the true nature of the disorder is different for each child, shouldn't the children with the same problem have average language test results?

In the present study, the relationship of language tests with speech and language problems has been evaluated in this study and special differences of receptive and expressive languages has been found among the evaluated groups.

Listening Disorder Group: Since the language development of most of the children (n=20) with listening disorder was normal, it indicates that, while causing language and speech problems, listening disorders have no effect on language development in many children. Determining expressive language delay in only 2 of 22 children shows that they have a discrepancy between expressive and receptive language skills. This finding indicates that listening difficulty could influence language development, at least in some children. Listening difficulty may be associated with conditions such as SLI or APD, short-term memory, or limited working memory capacity. For instance, APD represents a mixed and poorly understood listening problem characterized by poor speech perception, especially in challenging

environments. These children, who have receptive and/or expressive language disorder, may have a discrepancy between expressive and receptive language skills^{8,18}.

Attention Deficit Group: The results revealed that attention deficit somehow affects language development. Each child of this group (total of 3) had a different outcome on the language test. This difference shows that language development in such children is affected at various levels by their attention. However, since many factors are associated with attention disorder, it cannot be stated that a pure attention deficit impacts the language¹⁹.

Attention Deficit/ Hyperactivity Group: It was determined that ADHD directly affects language development, and that there is a big gap between chronologic and language ages of the children. Mixed receptive-expressive language disorder is the marked symptom among children with ADHD. This finding could not be detected in the group of the listening problem. Many of the studies regarding language abilities in ADHD did not separate children with only ADHD from those with co-morbid disorders, making it difficult to conclude whether the language impairments are specific to ADHD or related to the co-morbidity (20). The nature of ADHD, as described in the DSM-IV [American Psychiatric Association, 1994], indicates a potential association with language disorders²¹.

Previously Speaking Group: Delay in both receptive and expressive languages was found among children who were previously speaking but later quitted. This delay may signal a receptive-expressive language disorder. Language delay may be secondary. The profile of performance across the standardized measures for the language-impaired children with autism was similar to the profile which has been defined as specific language impairment²².

Delayed Speech Group: Language development impairment was found among children with

delayed speech. While 2 (twin girls) of the 10 children had expressive language delay, 8 presented with both expressive and receptive language delays. The gap between chronologic age and the age of receptive and expressive languages was wide in some of the children. Thus, it can be said that they are exhibiting a language disorder rather than a language delay. The mean age of the children in this group was over 3 years old. Their relatives mentioned a later-than-expected speaking initiation. These findings demonstrate that speech delay in these children causes impairment in language, rather than in speech. Difficulties in perception and learning may be the factors underlying speech delay and inadequate vocabulary. This is because deficits in speech perception predict language-learning impairment^{11,23}.

Our results demonstrated that children's language skills (receptive and expressive languages) should be assessed with an appropriate language test. Findings will provide a guide to determine whether children's problematic backgrounds are related to their language levels. Persistent problems that are of concern for parents or professionals should be regarded as symptoms requiring evaluation of the underlying cause and co-morbidity¹. The mean age of the study population was 3 years and 8 months old. In some children, the language and speech problems could have been prevented if they had referred earlier for a language testing. Medical doctors and ENT specialists should be aware of this knowledge by educational seminars.

Contrary to other studies, we found that the language development of children having the same type problems was affected in the similar areas (receptive and/or expressive language, or both). These findings demonstrate that the results of the language test are effective in determining the nature and type of the problem. As a conclusion, the language test outcomes were concordant with the type of language and speaking disorders. The results of the language test can be a guide in estimation of the main root factor of speech and language problems, in decision of referring to the proper institution and in the diagnosis and treatment of this institution

Conclusion

It was concluded that the outcomes of language tests reflect the background of children's problems. It was determined that language and speaking disorders, despite of their type, can affect language development or even cause language and speech problems.

The present study emphasized the importance of noting and diagnosing language and speech problems in children by means of language tests.

References

1. Baird G. Speech and language problems in pre-school children. *Current Paediatrics* 2001; 11: 19-27.
2. Resnick TJ, Allen DA, Rapin I. Disorders of language development: diagnosis and intervention. *Pediatr Rev* 1984; 6: 85-92.
3. Zimmerman IL, Castilleja NF. 2005, The role of a language scale for infant and preschool assessment. *MRDD* 2005; 11: 238-46.
4. Tallal P, Miller SL, Bedi G, Byma G, Wang X, Nagarajan SS, Schreiner C, Jenkins WM, Merzenich MM. Language comprehension in language-learning impaired children improved with acoustically modified speech. *Science* 1996; 271(5245):81-4.
5. Nicol T, Kraus N. Speech-sound encoding: physiological manifestations and behavioral ramifications. *Suppl Clin Neurophysiol* 2004; 57: 628-634.
6. Debonis DA, Moncrieff D. Auditory processing disorders: an update for speech-language pathologists. *Am J Speech Lang Pathol* 2008; 17: 4-18.
7. Ptok M, Buller N, Kuske S, Hecker H. Subjective assessment of auditory processing deficits and perceptual performance in children. *HNO* 2005; 53: 568-72.
8. Yalcinkaya F, Keith RW. Understanding auditory processing disorders. *Turk J Pediatr* 2008; 50, 101-105.
9. Shriberg LD, Kwiatkowski J. Developmental phonological disorders I: A clinical profile. *J Speech Hear Res.* 1994;37(5):1100-26.
10. Shriberg LD, Tomblin JB, McSweeney JL, Prevalence of speech delay in 6-year-old children and comorbidity with language impairment. *J Speech Lang Hear Res.* 1999 Dec;42(6):1461-81.
11. Shonkoff JP. Language delay: late talking to communication disorder. In A. M. Rudolph, J. I. Hoffman, C.D. Rudolph (eds), *Rudolph's pediatrics* (London: Prentice-Hall), 1996, pp. 124-128.
12. Montgomery JW. 2006, Real-time language processing in school-age children with specific language

- impairment. *Int J Lang Commun Disord* 2006; 41: 275-91.
13. Beitchman JH, Wilson B, Brownlie EB, Walters H, Lancee W. Long-term consistency in speech/language profiles: I. Developmental and academic outcomes. *Journal of the American Academy of Child and Adolescent Psychiatry* 1996; 35: 804-824.
 14. Law J, Boyle J, Harris F, Harkness A, Nye C. Prevalence and natural history of primary speech and language delay: Findings from a systematic review of the literature. *Int J Lang Commun Disord* 2000; 35: 165-188.
 15. Yalcinkaya F, Bayoglu B, Saracbası O, Belgin E. Turkish adaptation of speech and language disorders test: Preschool Language Scale, fourth edition: PLS-4. Seventh European Pediatric Neurology Society, EPNS Congress, 26-29 September 2007, Kusadasi, Turkey. Elsevier. 11, 87 (Abstract).
 16. 52nd WMA General Assembly, 2000, World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects. *JAMA*; 284: 3043-3049.
 17. Anlar B, Yalaz K. Denver II Gelisimsel Tarama Testi, Turk çocuklarına uyarlanması ve standardizasyonu. HUTF Ped Noroloji Bilim Dali, 1995, Ankara, Turkey.
 18. Bamiou, DE, Musiek, FE, Luxon LM. Aetiology and clinical presentations of auditory processing disorders, a review. *Arch Dis Child* 2001; 85: 361-365.
 19. Ptok M, Buller N, Schwemmle C, Bergmann C, Lüerssen K. Auditory processing disorder versus attention deficit/hyperactivity disorder. A dysfunction complex or different entities?. *HNO* 2006;54(5):405-8, 410-4.
 20. Chermak GD, Tucker E, Seikel JA. Behavioral characteristics of auditory processing disorder and attention-deficit hyperactivity disorder: predominantly inattentive type. *J Am Acad Audiol* 2002; 13: 332-8.
 21. Camarata SM, Gibson T. Pragmatic language deficits in attention-deficit hyperactivity disorder (ADHD). *Ment Retard Dev Disabil Res Rev* 1999; 5: 207-214.
 22. Kjelgaard MM, Tager-Flusberg H. An Investigation of Language Impairment in Autism: Implications for Genetic Subgroups. *Lang Cogn Process* 2001; 16: 287-308.
 23. Ziegler JC, Pech-Georgel C, George F, Alario FX, Lorenzi C. Deficits in speech perception predict language learning impairment. *Proc Natl Acad Sci* 2005; 27;102(39):14110-5

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