

# Aggression Behaviors in Children with and without Hearing Impairment

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Received: March 7, 2016

Accepted: March 28, 2016

Online Published: April 5, 2016

doi:10.5539/ijps.v8n2p14

URL: <http://dx.doi.org/10.5539/ijps.v8n2p14>

## Abstract

The aim of this study is evaluating aggression behaviors of children with hearing impairment and comparing them with their peers who do not have any kind of hearing problems. For this purpose, 81 children with hearing impairment and 80 children with no hearing problems between the ages of 10-17 years were included in the study (a total of 161 children). The data of the study were obtained by Buss-Perry Aggression Questionnaire and the General Information Form. According to the results of this study, the total aggressiveness varies depending on age and hearing children show less aggressive behaviors as they get older; however, in children with hearing impairment, no difference was observed in their aggressive behaviors depending on their ages; gender creates a difference in total aggression behaviors in both children groups with and without hearing impairment and boys show more aggression behaviors compared to girls; children, who received pre-school education, with impairment show more aggressive behaviors, the existence of another hearing impairment family member increases the physical and indirect aggression behaviors of children with hearing impairment.

**Keywords:** child, a child with hearing impairment, aggression

## 1. Introduction

According to the World Health Organization, in 2011, there were 360 million hearing impaired individuals and 32 million of these individuals are hearing-impaired children (WHO, 2011). The incidence of hearing loss was found to be 0.37% in Turkey and this rate goes up to 0.45% in the rural areas. There are 63,173 children with hearing impairment between the ages of 0-19 years in Turkey. When we look at these rates, it will not be wrong to say that one of the most common types of impairment is hearing disability. Although hearing disability affects individuals directly, it also affects the parents and the environment of these individuals with disabilities, so it can also be considered with its social impacts. Therefore, it will be wrong to consider this situation as a disability only. Hearing impairment may cause many problems in the development of the child. Since children with hearing impairment don't have fully developed speaking and listening skills and they are unable to speak functionally, they have deficiencies in terms of social and communicational skills and it is quite possible for these children to encounter difficulties in communication with the outside world (Hummel & Schirman, 1984; Leigh & Stinson, 1991; Van Oyen et al., 2001; Scheetz, 2004; Hoffman et al., 2015). The negativities experienced by hearing-impaired children when entering the socialization process without the chance to choose differ from their peers and these negativities considered as unreachable boundaries despair them; and therefore, aggressive behaviors, low self-esteem, despair, worthlessness and the feelings of anger and frustration arise in these children.

In fact, the definition of aggression is a concept known but its boundaries are very broad. There are several theories regarding the source of aggression. These theories can be analyzed in two groups in general. While the first group states that aggression is instinctive and impulsive, second group suggests that aggression has a social origin (Köknel, 1996). While Freud expresses aggression as directing destructive tendencies of people to the outside world, Adler, defines aggression as a stimulation arising from the desire to meet their own needs and against obstacles. According to Fromm, who indicates that there is aggression in genetics of both humans and animals, aggression is a response of humans and animals comes out when they feel that their existence is in danger. Lorenz, thinks that aggression is one of the main arrangers of social system and it exists in the nature of species. Berkowitz divided aggression into two groups as hostile and instrumental. Bandura did not discuss

aggression within the concepts of intention/purpose; instead, he considered aggression within behavior patterns that disrupt or damage the social rules. Buss, analyzed aggression based on three aspects; physical-verbal, active-passive and direct-indirect aggression, respectively (Aydin, 2005; Marschark & Wauters, 2011).

According to psychoanalytic approach, there is a feeling of aggression motivating offensive behaviors in individuals that emerges when they face an obstacle precluding them from any goal they desire to reach. From this point of view, aggression is an innate driving force and it may cause from the person's own assessment as feeling to preclude himself/herself or being precluded by outside factors. Hearing disability is a form of prevention and could therefore act more strongly in individual aggression tendencies.

In some of the studies investigated aggression in hearing-impaired children; it has been reported that children with hearing-impairment show more aggressive behaviors compared to those with no hearing-impairment and they have the feeling of isolation since they exhibit more depressive behaviors (Motemedi et al., 2007; Van Gent et al., 2011; Rostami et al., 2014), experience behavioral disorders (Mooler, 2000; Stevenson et al., 2010; Ekim & Ocakçı, 2012; Theunisian et al., 2014) and deficiencies in the development process of social skills (Sheepard & Bodger, 2010). On the other hand, according to some of these studies, aggression levels of these children are close to their peers with no hearing-impairment and other problems experienced are not caused by hearing impairment (Konuk, 2006; Remine & Brown, 2010). According to the results of several studies, many problems including aggressive behaviors are reduced with the development of social skills, problem solving and communication skills (Pakaslahti et al., 1996; Chang & Sanna, 2003; Fung & Tsang, 2007). As it can be seen, there are differences between the results of these studies. Such diversity is thought to be due to the differences between groups and methods used.

In the studies regarding aggression in children with no hearing-impairment, it has been determined that psychological maturity is both directly and indirectly related to aggression, aggressive behaviors disrupt peer relationships (Morales-Vives et al., 2014), there is a positive relationship between age, gender, perceived success, anger and aggression, aggressive children in elementary school still behave aggressively during their adolescence and adulthood periods and cultural structures have impacts on aggressive behaviors (Liu & Chen, 2003; Fung & Tsang, 2007; Lee et al., 2007; Fung et al., 2009; Yamasaki & Nishida, 2009; Donat-Bacioğlu & Özdemir, 2012; Uz-Baş et al., 2012).

In the light of the above mentioned explanations, the aim of this study is determining aggressive behaviors of both children with hearing impairment and no hearing-impairment, identifying differences between them in terms of aggressive behaviors possible reasons causing this difference.

## **2. Methods**

### *2.1 Participant*

In this study, a total of 161 children including 81 children attending a public school for hearing impaired and 80 children with no hearing problems levels in the province of Adana located in the south of Turkey participated. The age of these children included in the study ranged between 10-17 years and they are at similar socio-economic levels. The socio-economic development report of Adana Province prepared by Turkey's State Planning Organization was used for socio-economic classification (Republic of Turkey Ministry of Development, National Strategy for Regional Development Report, 2014). According to this ranking, Adana is grouped as "lower-middle and upper level" by socio-economic income levels. Adana School for the Deaf is the only school for children with hearing loss in Adana. Thus, the other school for hearing children is selected from the same region and socio-economic income level. While selecting the population of the study; the group with hearing-impairment was created with individuals with no other impairment other than hearing problem and their impairment should be identified medically. In this study, categorization of hearing developed by Turnbull et al. (2002) was used to show the effect of hearing loss on communication (Table 1).

Table 1. Categories of hearing loss and impacts on communication

Degrees of Hearing Loss	Category	Impacts on Communication
27 to 40 dB	Mild	Typically placed in regular education program, may benefit from a speech reading program.
41 to 55 dB	Moderate	Has the ability to understand conversational speech at distance of 3 to 5 feet. Can benefit from a hearing aid, auditory training and speech therapy. Group activities can be challenging.
56 to 70 dB	Moderately Severe	Conversation will not be heard unless it is loud. The person will benefit from all of the above and should also receive enhanced language instruction.
71 to 90 dB	Severe	May identify environmental noises and loud sounds. May be able to distinguish vowels but not consonants, special education classes designed for deaf children may be beneficial. Speech is not always intelligible.
91 dB+	Profound	Does not rely on hearing for primary means of communication, may hear some loud sounds, special education services are beneficial. Speech may be difficult to understand, or may not be developed

All children (N=81) with hearing impairment included in the study have moderate level of hearing impairment (56 dBHL-70 dBHL). 62 of these children use hearing aids regularly, while the remaining 19 children don't use this device. 8 of these children use this device for 1-2 years, while 33 of them use for 2-4 years, 21 of them use for 5 years and longer, respectively. Children with hearing impairment were selected from families that are still together (not divorced) and capable of evaluating the scales to be implemented. In addition, children with no hearing impairment and no other disability were selected from families that are still together (not divorced) and capable of evaluating the scales to be implemented. Demographic information of the students included in the study are presented in Table 2.

Table 2. Demographic information about sample

Variables	Hearing Impaired Children			Hearing Children	
	Features	N	%	N	%
Gender	Female	32	39.51	45	56.25
	Male	49	60.49	35	43.75
Age	10	8	9.87	8	10
	11	7	8.64	10	12.5
	12	12	14.81	10	12.5
	13	8	9.87	7	8.75
	14	14	17.28	11	13.75
	15	13	16.05	12	15
	16	12	14.81	10	12.5
Pre-School Education Receiving Status	I receive	52	64.20	28	35
	I didn't receive	29	35.80	52	65
The case of other individual with impaired in the family	No	38	46.91	74	92.5
	One or more siblings	31	38.27	5	6.25
	Mother and father	4	4.94	1	1.25
	Whole family	8	9.88	-	-

Use of the device	Not use	19	23.45
	Use	62	76.25
Use of the device time	Not use	19	23.45
	1-2 year	8	11.11
	3-4 year	33	40.74
	5 year and above	21	25.93
Preferred mode of communication	Sing language	23	28.39
	Oral	2	2.47
	Total	56	69.14

## 2.2 Procedure

After determining the schools to be surveyed, required permissions are received. Then these schools were contacted and teachers and students were informed about the study. Study was conducted based on volunteering. Demographic information of the students included in the study were presented in "General Information Form". Then, "Buss Perry Aggression Scale" was explained to the children with hearing-impairment by using the method of communication they prefer to use (2 children preferred to speak, 23 of them preferred to use sign language and 56 of them preferred to use the total method). Each student filled out the form in an empty room. There was no time limitation set for students while filling out the form; however, the maximum time spent for filling out the form was 20 minutes. Required disclosures were made when the complex expression and statements. A similar procedure was applied on other children with no hearing-impairment. Finally, all data obtained were collected and combined.

As a result of the normality test (Kolmogorov-Smirnov) applied on the data obtained in order to determine the effects of variables set for children in the sample group on their aggressive behaviors; data distribution was found to be normal. Analyses of variance (GLM-ANOVA) were conducted by using SPSS procedures. When a significant difference was found among variables, Duncan's Multiple Range Tests were performed to determine the differences among the mean values ( $p < 0.05$ ).

## 2.3 Material

In the research, we used "Buss-Perry Aggressiveness Questionnaire (BPAQ)" and "General Information Form" created for the purpose of obtaining some demographic information about the group investigated.

### 2.3.1 Buss-Perry Aggressiveness Questionnaire

The Aggressiveness Questionnaire was developed by Buss and Perry (1992) for the purpose of measuring aggressiveness. BPAQ is among the most frequently used aggressiveness questionnaires in global literature and it is a kind of 5 point likert scale. With an end to investigate the psycho-metric properties of BPAQ, a great deal of researches were conducted by use of various methods and most of them revealed findings supporting the structure of authentic form. The scale, which is based on self-assessment technique, consisted of 34 items. There are five subscales as follows: Physical (For example; item 8-if someone hits me, I hit back regardless of the person's gender, item 25-if someone hits me, I hit back, etc.), verbal (For example; item 4-I find myself frequently arguing with other people, item 20-if people drive me crazy, I can tell them my real thoughts), indirect aggression (For example; item 13-if I get very mad, I can ruin the things that people do, item 18-I spread gossips about people that I don't like), anger (For example; item 3-I suddenly shine but calm down soon, item 29-sometimes I feel like a bomb ready to explode) and hostility (For example; item 5-Sometimes, I think life is not fair to me, item 31-I know that my friends talk behind my back). Total aggression is the sum of scores obtained from these five subscales. The highest score that can be received from the scale is 170, while the lowest score is 34. The shortness and simplicity of BPAS make it easier to apply the scale on both children and individuals having difficulties to understand (O'Connor et al., 2001; Ireland & Archer, 2004).

Adaptation of questionnaire to Turkish, the validation and reliability studies were performed by Can (2002). According to the findings, the test-repeat test reliability and internal consistency of the questionnaire and sub-questionnaires are satisfying and there are meaningful correlations among each one of sub-questionnaires. The internal consistence coefficients obtained by Buss and Perry (1992) in their authentic studies are as follows: physical aggressiveness 0.85, verbal aggressiveness 0.72, anger 0.83, hostility 0.77 and total score is 0.89 (Buss & Perry, 1992; Archer et al., 1995; Harris, 1995; Archer & Haigh, 1997).

### 3. Results

Considering the data given in Table 3, the total aggressiveness varies depending on age and hearing impairment of the child in both children groups with and without hearing impairment ( $F=2.795$ ;  $p=0.009$ ). Hearing children show less aggressive behaviors as they get older; however, in children with hearing impairment, no difference was observed in their aggressive behaviors depending on their ages. In addition, although no difference was found between two groups in terms of aggressive behaviors until they become 14 years old, the increase in the aggressive behaviors of children with hearing impairment after this age is noteworthy. Considering subscales, no difference was found in terms of both verbal aggression and anger subscales ( $F=1.904$ ;  $p=0.073$ ). Considering physical aggression subscales, children with hearing impairment are determined to be more aggressive compared to hearing children regardless of age ( $F=1.694$ ;  $p=0.115$ ). In the hostility subscale, although there was no difference between two groups, children with hearing impairment show less hostile behaviors compared to hearing children until 14 years of age ( $F=2.294$ ;  $p=0.030$ ). In the subscale of indirect aggression, although there was no difference between children with hearing impairment in various ages, an increase in indirect aggressive behaviors of hearing children was observed at early ages (10-12 age). As it can be seen on the Table, although hearing impairment has no effect on indirect aggression at early ages, children with hearing impairment show more aggressive behaviors at older ages (13-17 age) compared to hearing children ( $F=3.287$ ;  $p=0.003$ ).

In Table 4, which contains sex and aggression data, it has been shown that the total aggressive behaviors vary in hearing and hearing impaired children depending on their gender ( $F=4.889$ ;  $p=0.028$ ) and boys are determined to be more aggressive compared to girls in both groups. In the subscales, hearing girls and boys are determined to be more aggressive compared to girls and boys with hearing impairment. However, in the indirect aggression subscale this situation is total opposite. Thus, girls and boys with hearing problems are determined to have more indirect aggressive behaviors compared to hearing girls and boys. In both subscales, boys seem to be more aggressive compared to girls. In the physical aggression subscale, there is no difference between physical aggression behaviors of girls and boys with hearing impairment, while in the group of hearing children, boys show more physical aggression behaviors compared to girls. Although disabilities don't affect physical aggression behaviors of boys, while girls with hearing impairment are determined to have more physical aggression behaviors compared to other girls with no hearing impairment. In aggression and anger subscales, no difference was found between behaviors of children depending on their gender and disabilities.

Table 3. Aggression scores of hearing impaired and hearing children with age (Mean  $\pm$  St. Error)

Age	Total Aggression <sup>1</sup>		Hostility		Indirect Aggression		Physical Aggression		Verbal Aggression		Anger	
	Hearing impaired	Hearing	Hearing impaired	Hearing	Hearing impaired	Hearing	Hearing impaired	Hearing	Hearing impaired	Hearing	Hearing impaired	Hearing
10	99.38 $\pm$ 6.73	106.25 $\pm$ 6.42 a <sup>2</sup>	19.25 $\pm$ 0.88 B	25.25 $\pm$ 2.19 A	17.75 $\pm$ 1.23	17.37 $\pm$ 1.93 a	23.87 $\pm$ 2.32	23.25 $\pm$ 2.32	15.37 $\pm$ 1.36	16.25 $\pm$ 2.18	23.25 $\pm$ 1.46	25.25 $\pm$ 2.19
11	89.43 $\pm$ 8.50	106.40 $\pm$ 3.74 a	18.00 $\pm$ 1.17 B	25.10 $\pm$ 1.06 A	15.14 $\pm$ 1.72	15.40 $\pm$ 0.86 abc	22.00 $\pm$ 2.48	25.40 $\pm$ 2.07	13.71 $\pm$ 1.50	16.00 $\pm$ 0.86	20.57 $\pm$ 1.97	25.10 $\pm$ 1.06
12	91.42 $\pm$ 5.79	98.20 $\pm$ 6.60 ab	17.92 $\pm$ 1.09 B	23.90 $\pm$ 1.97 A	15.58 $\pm$ 1.12	16.70 $\pm$ 1.27 ab	22.33 $\pm$ 1.89	19.80 $\pm$ 2.07	13.92 $\pm$ 0.81	16.00 $\pm$ 0.89	20.83 $\pm$ 1.16	23.90 $\pm$ 1.97
13	107.00 $\pm$ 8.81	98.71 $\pm$ 6.77 ab	19.00 $\pm$ 1.21 B	26.43 $\pm$ 1.86 A	17.87 $\pm$ 0.64 A	13.00 $\pm$ 1.72 B bc	24.25 $\pm$ 2.39	21.57 $\pm$ 2.48	16.37 $\pm$ 1.47	14.28 $\pm$ 1.49	24.50 $\pm$ 1.15	26.43 $\pm$ 1.86
14	98.50 $\pm$ 3.96 A <sup>3</sup>	81.82 $\pm$ 4.28 B b	18.93 $\pm$ 0.85	21.91 $\pm$ 1.34	17.42 $\pm$ 0.72 A	11.73 $\pm$ 0.87 B c	23.29 $\pm$ 1.75	17.18 $\pm$ 1.98	15.50 $\pm$ 0.63	13.64 $\pm$ 0.69	23.28 $\pm$ 0.94	21.91 $\pm$ 1.34
15	97.77 $\pm$ 2.40 A	81.83 $\pm$ 7.37 B b	18.61 $\pm$ 0.69	20.58 $\pm$ 1.65	17.54 $\pm$ 0.64 A	13.17 $\pm$ 1.06 B bc	24.00 $\pm$ 1.82	15.83 $\pm$ 1.89	14.69 $\pm$ 0.66	12.75 $\pm$ 1.27	22.92 $\pm$ 0.85	20.58 $\pm$ 1.65
16	100.75 $\pm$ 3.86 A	86.40 $\pm$ 4.85 B b	19.50 $\pm$ 0.87	21.80 $\pm$ 0.95	17.75 $\pm$ 0.66 A	14.40 $\pm$ 1.24 B abc	25.42 $\pm$ 1.89	17.60 $\pm$ 2.07	15.58 $\pm$ 0.70	12.40 $\pm$ 1.31	23.00 $\pm$ 1.38	21.80 $\pm$ 0.95
17	103.00 $\pm$ 4.01 A	86.92 $\pm$ 4.08 B b	20.14 $\pm$ 0.96	21.67 $\pm$ 1.02	18.57 $\pm$ 0.89 A	12.58 $\pm$ 1.09 B c	25.14 $\pm$ 2.48	19.92 $\pm$ 1.89	16.00 $\pm$ 1.02	13.83 $\pm$ 0.97	22.59 $\pm$ 0.43	23.04 $\pm$ 0.55
Grand Mean							23.78 $\pm$ 0.60 A	19.79 $\pm$ 0.86 B				
	Hear X Age $F=2.80$ ; $p=0.009$		Hear X Age $F=2.29$ ; $p=0.030$		Hear X Age $F=3.29$ ; $p=0.003$		Hear X Age $F=1.69$ ; $p=0.115$		Hear X Age $F=1.90$ ; $p=0.073$		Hear X Age $F=1.70$ ; $p=0.13$	
	Age $F=1.58$ ; $p=0.145$		Age $F=1.54$ ; $p=0.158$		Age $F=1.21$ ; $p=0.298$		Age $F=0.99$ ; $p=0.442$		Age $F=0.78$ ; $p=0.609$		Age $F=1.49$ ; $p=0.175$	
	Hear $F=3.28$ ; $p=0.072$		Hear $F=10.78$ ; $p=0.001$		Hear $F=27.21$ ; $p=0.000$		Hear $F=12.29$ ; $p=0.001$		Hear $F=1.83$ ; $p=0.178$		Hear $F=1.15$ ; $p=0.286$	

<sup>1</sup>Each size is assessed in itself.

<sup>2</sup>Different small letters in the same column are different from the statistical point of view.

<sup>3</sup>BIG LETTERS different in the same row are different from the statistical point of view.

Table 4. Aggression scores of hearing impaired and hearing children with gender (Mean  $\pm$  St. Error)

Gender	Total Aggression <sup>1</sup>			Hostility		Indirect Aggression		Physical Aggression		Verbal Aggression		Anger	
	Hearing impaired	Hearing	Mean	Hearing impaired	Hearing	Hearing impaired	Hearing	Hearing impaired	Hearing	Hearing impaired	Hearing	Hearing impaired	Hearing
Female	95.66 $\pm$ 3.04 a	88.44 $\pm$ 3.14b	91.44 $\pm$ 2.25 b <sup>2</sup>	18.72 $\pm$ 0.79	20.69 $\pm$ 0.67	16.94 $\pm$ 0.64	14.24 $\pm$ 0.54	23.03 $\pm$ 0.95 aA	17.33 $\pm$ 1.01 bB	14.37 $\pm$ 0.53	13.93 $\pm$ 0.65	22.25 $\pm$ 0.69	22.20 $\pm$ 24.11
Male	99.86 $\pm$ 2.37 b	99.86 $\pm$ 2.37a	98.69 $\pm$ 1.80 a	18.98 $\pm$ 0.64	21.17 $\pm$ 0.76	17.37 $\pm$ 0.52	14.06 $\pm$ 0.62	24.26 $\pm$ 0.79 a	22.94 $\pm$ 1.33 aA	15.59 $\pm$ 0.41	14.74 $\pm$ 0.54	22.82 $\pm$ 0.49	24.11 $\pm$ 0.60
Grand Mean				18.88 $\pm$ 0.50 B <sup>3</sup>	20.90 $\pm$ 0.51 A	17.20 $\pm$ 0.41 A	14.16 $\pm$ 0.41 B						
	Hear X Gender F=0.57; p=0.450 Gender F=4.89; p=0.028 Hear F=3.02; p=0.084			Hear X Gender F=0.02; p=0.877 Gender F=0.27; p=0.605 Hear F=8.42; p=0.004		Hear X Gender F=0.57; p=0.450 Gender F=4.89; p=0.028 Hear F=3.01; p=0.084		Hear X Gender F=4.57; p=0.034 Gender F=11.18; p=0.010 Hear F=11.76; p=0.010		Hear X Gender F=0.14; p=0.713 Gender F=3.36; p=0.069 Hear F=1.37; p=0.245		Hear X Gender F=0.95; p=0.330 Gender F=0.95; p=0.074 Hear F=0.82; p=0.367	

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According to the data presented in Table 5, pre-school education and hearing-impairment affect total aggression behaviors of children ( $F=14.938$ ;  $p=0.00$ ). As it can be seen in the table, children with hearing-impairment, who received pre-school education, are determined to be more aggressive compared to children, who did not receive pre-school education. In the hostility subscale, although no difference was found between two groups who received pre-school education, the hostile behaviors of hearing children, who didn't received pre-school education, is found to be higher compared to hostile behaviors of children received pre-school education with hearing-impairment. In the indirect aggression subscale, indirect aggressive behaviors of children received pre-school education with hearing-impairment were found to be higher than indirect aggressive behaviors of children, who did not receive pre-school education, with hearing-impairment. In the physical aggression subscale, although providing pre-school education for children with hearing-impairment has no effect on their behaviors, hearing children, who didn't receive pre-school education, are determined to have more physical aggression behaviors compared to hearing children, who received pre-school education. In the verbal aggression subscale, verbal aggressive behaviors of children received pre-school education with hearing-impairment were found to be higher than verbal aggressive behaviors of children, who did not receive pre-school education, with hearing-impairment. In addition, there was no difference between verbal aggressive behaviors of hearing children. Although children received pre-school education with hearing-impairment show more verbal aggressive behaviors compared to hearing children received pre-school education, no difference was found between children, who did not receive pre-school education. In the anger subscale, while anger behaviors of children received pre-school education with hearing-impairment were found to be higher than anger behaviors of children, who did not receive pre-school education, with hearing-impairment; no difference was found between hearing children in terms of anger behaviors.

Considering the data illustrated in Table 6, we have observed that the existence of another family member with hearing impairment increases the physical and indirect aggressive behaviors of children with hearing-impairment while it reduces the hostile behaviors of these children. Children with hearing impairment, who have one or more siblings with hearing impairment, show more aggressive behaviors compared to those who have no siblings with hearing impairment. In addition, hearing children, who have one or more siblings with hearing impairment, show more aggressive behaviors than other children with hearing-impairment, who have one or more siblings with hearing impairment. There are no differences between other subscales and no difference was found between children with and without hearing impairment ( $F=0.013$ ;  $p=0.911$ ).

Table 5. Aggression scores of hearing impaired and hearing children with pre-school education receiving status (Mean  $\pm$  St. Error)

Preschool Education Receiving Status	Total Aggression <sup>1</sup>		Hostility		Indirect Aggression		Physical Aggression		Verbal Aggression		Anger	
	Hearing impaired	Hearing	Hearing impaired	Hearing	Hearing impaired	Hearing	Hearing impaired	Hearing	Hearing impaired	Hearing	Hearing impaired	Hearing
I didn't receive	90.93 $\pm$ 3.36 b <sup>2</sup> B <sup>3</sup>	100.32 $\pm$ 3.32 a A	17.90 $\pm$ 0.64 b B	21.82 $\pm$ 1.01 A	15.48 $\pm$ 0.63 b	15.75 $\pm$ 0.80 a	22.55 $\pm$ 1.13	23.18 $\pm$ 1.21 a	13.96 $\pm$ 0.59 b	14.96 $\pm$ 0.79	20.62 $\pm$ 0.78 b B	24.61 $\pm$ 0.92 A
I receive	101.88 $\pm$ 1.74 a A	87.83 $\pm$ 2.43 b B	19.35 $\pm$ 0.36 a	20.43 $\pm$ 0.78	18.51 $\pm$ 0.32 a A	13.31 $\pm$ 0.54 b B	24.71 $\pm$ 0.71 A	17.96 $\pm$ 0.89 b B	15.81 $\pm$ 0.38 a A	13.92 $\pm$ 0.51 B	23.69 $\pm$ 0.38 a	22.19 $\pm$ 0.67
	Hear X Education F=14.94; p=0.00 Education F=0.21; p=0.651 Hear F=0.88; p=0.348		Hear X Education F=2.29; p=0.030 Education F=1.54; p=0.158 Hear F=10.78; p=0.001		Hear X Education F=20.44; p=0.00 Education F=0.04; p=0.840 Hear F=16.39; p=0.000		Hear X Education F=1.69; p=0.115 Education F=0.99; p=0.442, Hear F=12.29; p=0.001		Hear X Education F=6.79; p=0.010 Egitim F=0.57; p=0.451 Duyuma F=0.50; p=0.480		Hear X Education F=16.04; p=0.000 Education F=0.23; p=0.632 Hear F=3.29; p=0.071	

<sup>1</sup>Each size is assessed in itself.

<sup>2</sup>Different small letters in the same column are different from the statistical point of view.

<sup>3</sup>BIG LETTERS different in the same row are different from the statistical point of view.

Table 6. Aggression scores of hearing impaired and hearing children with the case of other individual with hearing impaired in the family (Mean  $\pm$  St. Error)

The case of other individual with hearing impaired in the family	Total Aggression <sup>1</sup>			Hostility		Indirect Aggression		Physical Aggression		Verbal Aggression		Anger		
	Hearing impaired	Hearing	Mean	Hearing impaired	Hearing	Hearing impaired	Hearing	Hearing impaired	Hearing	Hearing impaired	Hearing	Hearing impaired	Hearing	
No	92.66 $\pm$ 2.88	91.32 $\pm$ 2.08	91.62 $\pm$ 1.70 b <sup>2</sup>	18.00 $\pm$ 0.50	20.74 $\pm$ 0.52	16.24 $\pm$ 0.42	14.12 $\pm$ 0.42	22.26 $\pm$ 0.98	19.76 $\pm$ 0.77	14.26 $\pm$ 0.56	14.31 $\pm$ 0.40	21.31 $\pm$ 0.67	22.54 $\pm$ 0.48 b <sup>2</sup>	
One or more sibling	101.58 $\pm$ 2.34	103.00 $\pm$ 7.30	102.92 $\pm$ 3.10 a	19.55 $\pm$ 0.55	22.83 $\pm$ 1.82	17.93 $\pm$ 0.65	14.67 $\pm$ 1.47	25.00 $\pm$ 0.82	20.17 $\pm$ 2.72	15.64 $\pm$ 0.37	16.17 $\pm$ 1.39	23.48 $\pm$ 0.74B	29.17 $\pm$ 1.68 aA	
Mother and father	106.00 $\pm$ 5.24	–	106.00 $\pm$ 5.24 a	19.00 $\pm$ 0.91	–	18.75 $\pm$ 1.80	–	25.75 $\pm$ 3.37	–	18.25 $\pm$ 2.39	–	23.50 $\pm$ 2.06	–	
Whole family	105.12 $\pm$ 3.35	–	105.12 $\pm$ 3.35 a	19.87 $\pm$ 0.69	–	18.12 $\pm$ 1.28	–	26.87 $\pm$ 1.44	–	15.87 $\pm$ 0.44	–	24.75 $\pm$ 1.45	–	
Grand Mean				18.88 $\pm$ 0.73 B <sup>3</sup>	20.90 $\pm$ 0.95 A	17.20 $\pm$ 0.59 A	14.16 $\pm$ 0.77 B	23.78 $\pm$ 1.10 A	19.19 $\pm$ 1.41 B					
	Hear X Other hearing impaired F=0.01; p=0.911	Other hearing impaired F=2.81; p=0.041	Hear F=0.01; p=0.928	Hear X Other hearing impaired F=0.07; p=0.788	Other hearing impaired F=1.05; p=0.374	Hear F=7.36; p=0.007	Hear X Other hearing impaired F=0.43; p=0.514	Other hearing impaired F=0.99; p=0.399	Hear F=0.32; p=0.003	Hear X Other hearing impaired F=0.48; p=0.491	Other hearing impaired F=0.83; p=0.477	Hear F=4.76; p=0.031	Hear X Other hearing impaired F=4.92; p=0.028	Other hearing impaired F=7.31; p=0.000
													Hear F=11.81; p=0.001	

<sup>1</sup>Each size is assessed in itself.

<sup>2</sup>Different small letters in the same column are different from the statistical point of view.

<sup>3</sup>BIG LETTERS different in the same row are different from the statistical point of view.

#### 4. Discussion

The first finding of the study is the effect of age and hearing impairment on total aggressive behaviors of both children groups with and without hearing impairment (Table 3). Hearing children are determined to have less aggressive behaviors with age; however, children with hearing impairment have more aggressive behaviors with age. The total aggressive behaviors of hearing children decrease with age, whereas these behaviors increase in children with hearing impairment. In addition, although no difference was found between these two groups in terms of aggressive behaviors until they reach 14 years of age, the increase in the aggressive behaviors of children with hearing impairment after this age is noteworthy. When we reviewed the studies focusing on this topic, although there are some studies suggesting that aggression increases as the age of children increases (Tok, 2001; Theunissen et al., 2014), some other studies suggest that aggression is a behavior that can be seen at every age of the children (Köksal, 1991; Arıcak, 1995; Tuzgöl, 1998; Gümüş, 2000). Children included in the study group are in their adolescence period. It is not surprising that hearing impairment is a risk factor of problems such as depression and aggressive behaviors in adolescents (Turner et al., 2007; Salhi et al., 2009). We know that these traumatic incidences experienced by children in childhood have strong ties with negativities to be experienced during their lives. This can explain the increased aggressive behaviors of children with hearing impairment included in the study as they get older. Children understand their disabilities and limitations caused by these disabilities as they get older. It is also surprising that aggressive behaviors of hearing children are reduced after the age of 14 years. According to Ericson, developmental task of young adulthood is establishing close relationships with others and it can be said that young people narrow the density of communication network of their friendship relations during this period. Since narrowing communication networks leads to more intense relationships, close relationships established may limit the aggressive behaviors to be exhibited between individuals. The meaning attributed to the importance of interpersonal communication can reduce the aggression.

In the subscales of verbal aggression and anger, the age of children does not constitute any difference. There are some other research results supporting these results (Siegel, 1986; Stoner & Spencer, 1987; Donat Bacioğlu & Özdemir, 2012). In the physical aggression subscale, children with hearing impairment show more physical aggression behaviors compared to their hearing peers. In addition, although there is no uniform distribution, their physical aggression behaviors increase as they get older (Eron & Huesmann, 1984; Dodge & Price, 1994). In the subscale of hostility, it has been seen that children with hearing impairment show less hostile behaviors compared to hearing children until 14 years of age. This finding is in line with some other research results (Siegel, 1986; Stoner & Spencer, 1987; Donat Bacioğlu & Özdemir, 2012). It is also thought that most of the obstacles and problems causing hostility become meaningless as the age of children increases and they do not prefer these aggressive behaviors along with an increase in their problem solving skills.

In the present study, it has been found that gender has effects on total aggressive behaviors (Table 4). According to the data given, boys seem to be more aggressive compared to girls. Although there are some studies consistent with this conclusion (Björkqvist et al., 1992; Arıcak, 1995; Tuzgöl, 1998; Takehiro et al., 1999; Gümüş, 2000; Tok, 2001; Pişkin, 2002; Kartal, 2008; Karriker-Jaffe et al., 2008; Yamasaki & Nishida, 2009; Uz-Baş et al., 2012; Derman-Taner, 2013; Morales-Vives et al., 2014), there are some other studies suggesting that girls are more aggressive than boys (Doğan, 2001). Besides, there are also some other studies indicating that there is no significant difference between opposite gender groups in terms of aggressive behaviors (Köksal, 1991; Björkqvist et al., 1992; Anderson et al., 2000; Sipal, 2010).

Gender is one of the most obvious difference between all beings. The difference depending on gender is developed by the community and a social meaning is attributed to this difference. In fact, aggressive behaviors depending on gender are revealed by the expression of aggressive behaviors by both children groups. Girls define aggression as negative behaviors resulting from the loss of control while boys consider aggression as a positive instrument to be used to strengthen their self-esteem and their behaviors are rewarded by their community. According to some studies conducted in this area, cultural structures have impacts on aggressive behaviors (Liu & Chen, 2003; Fung & Tsang, 2007). When we look at the relationship between aggression and gender from another angle, we can see that there is a connection between the levels of androgen in males and their aggressive behaviors. Although decreased aggressive behaviors along with aging support this thought, it is difficult to obtain precise scientific data on this hypothesis since conducting this type of studies on actual humans is unethical.

Considering subscales, we have seen that hearing children show more aggressive behaviors compared to their peers with hearing impairment; in the subscale of indirect aggression, children with hearing impairment show more indirect aggressive behaviors compared to their peers with no hearing impairment. Although there is no difference in terms of gender, there are some studies suggesting that girls show more indirect aggressive behaviors compared to boys (Björkqvist et al., 1992; Green et al., 1996; Takehiro et al., 1999). It is considered that children with hearing impairment in intense communication networks may prefer indirect aggressive behaviors. In the subscale of physical aggression, although no difference was found between girls and boys with hearing impairment, hearing boys are determined to have more physical aggression behaviors compared to hearing girls. There are many studies indicating that boys show more physical aggression behaviors compared to girls (Björkqvist et al., 1992; Green et al., 1996; Takehiro et al., 1999; Duque et al., 2003; Eroğlu, 2009; Donat-Bacıoğlu & Özdemir, 2012). Because boys think that they can achieve their goals with brute force and this thought is supported almost in every social and cultural structure (Björkqvist et al., 1992; Green et al., 1996; Takehiro et al., 1999; Duque et al., 2003; Eroğlu, 2009; Donat-Bacıoğlu & Özdemir, 2012). In the verbal aggression subscale, both gender and disability status of the children creates a difference between them. There are study results that support this data (Donat-Bacıoğlu & Özdemir, 2012). However, there are also some other studies indicating that boys show verbal aggression behaviors more than girls do (Bettencourt & Miller, 1996; Björkqvist, 1996). In the anger subscale, no difference was found depending on gender and disability status of children.

According to the data given in Table 2 and Table 5, 64.20% of children with hearing impairment and 35% of hearing children receive pre-school education. Pre-school education is compulsory in Turkey and it is offered for free in public pre-schools affiliated to the government. However, Adana is an agricultural area located in the south of Turkey. The research group included in the study are at middle socio-economic status (Republic of Turkey Ministry of Development, National Strategy for Regional Development Report, 2014). Since every season is busy in terms of agricultural activities in this region, parents working in agricultural fields take their children with them. This is considered to be the main reason of lower rate of receiving pre-school education by especially hearing children. On the other hand, children with hearing impairment are treated differently because of their impairment. Therefore, parents are spending effort for their children to receive pre-school education. According to Table 5, children, who received pre-school education, with hearing-impairment have more aggression behaviors compared to children, who did not receive pre-school education. In fact, pre-school education is important to all children and especially children with hearing impairment. Because children with hearing impairment can overcome many communicative and social problems they have experienced about language, speaking and understanding in these pre-schools. All children (N=81) with hearing impairment included in the study have moderate level of hearing impairment (56 dBHL-70 dBHL) and most of them (66.67%) started using hearing aids at early ages. This children were unable to attend pre-schools established for children with hearing impairment. They went to the regular pre-schools with children without any hearing problems. 45.68% of children attended to both regular pre-schools with normal kids and private educational

institutions providing education for children with hearing impairment at the same time. Thus, these children went to same pre-schools as their peers have attended. It is obvious that these children will face the impacts of social and emotional trauma that they experience during pre-school in their following years since they compare themselves with other kids, realize their disabilities and negativities caused by these disabilities. If individuals perceive a condition as prohibitive, then they feel angry and mad. These feelings may sometimes be accompanied by aggressive behaviors. It has been thought that higher level of aggressive behaviors of children, who received pre-school education, with hearing impairment may be caused by these reasons. In fact, in the relevant studies, it has been suggested that aggressive behaviors and other negative behaviors more likely seen in children with hearing impairment are not caused by their disabilities, but parents-child and environmental interactions that are not established in a healthy way and at early ages (Moeller, 2007; Motemmedi et al., 2007; Salhi et al., 2009). When we reviewed the relevant studies, we have seen that although there are several studies indicating that the relationship between pre-school education and aggressive behaviors is insignificant (Moeller, 2000; Sipal, 2010), there are also some other findings suggesting that the level of aggressive behaviors drops down as the educational level increases in these children (Edmanson & Bullock, 1998; Ersoy, 2001).

In the subscale of hostility, there is no difference between both groups who received pre-school education. However, there is difference between groups who didn't receive pre-school education. Hearing children, who received pre-school education, are determined to have more hostile behaviors compared to their peers with hearing impairment. In the subscale of indirect aggression, although there is no difference between groups who didn't receive pre-school education, children, who received pre-school education, with hearing impairment show these behaviors more than hearing children. These children establish longer and more intensive relationships with their peers with no hearing problems. It has been thought that they show indirect aggressive behaviors to be part of social relationships, show and prove themselves. It has been also seen that children, who received pre-school education, with hearing impairment show more physical aggression behaviors compared to hearing children. Social and emotional development depends on mainly communication and children with hearing impairment may have difficulties to start and maintain communication with others due to the lack of language skills needed for effective social interactions (Van Oyen et al., 2001; Sunal & Çam, 2005). It has been thought that children feel angry due to these difficulties and show more physical aggression behaviors to express their anger. Children, who received pre-school education, with hearing impairment show more verbal aggression behaviors compared to hearing children, who received pre-school education. According to the studies conducted in this area, individuals exhibiting physical aggression behaviors also show verbal aggression behaviors (Duque, Klevens, & Ramirez, 2003; Donat-Bacıoğlu & Özdemir, 2012). In the anger subscale, although children, who received pre-school education, with hearing impairment show more anger behaviors compared to those, who did not receive pre-school education, there is no difference between hearing children in terms of receiving pre-school education. However, hearing children, who did not receive pre-school education, show more anger behaviors compared to their peers.

Another finding of the study is that there is no relationship between the existence of another family member with hearing impairment and hearing impairment of the child in terms of aggression (Table 6). However, aggression levels of children, who have a father or mother with hearing impairment, are higher compared to their peers. The existence of a hearing impaired family member increases indirect and physical aggression behaviors of children with hearing impairment while reduces their hostile behaviors. Hearing children, who have one or more siblings with hearing impairment, show more aggressive behaviors compared to children with hearing impairment. No difference was found in other subscales. When we reviewed some other studies conducted, we see that family is one of the main factors related to aggression. It is obvious that the existence of a disabled family member will directly affect the behaviors both children with and without hearing impairment. There are some factors such as the number of disabled people, type of disability, socio-economic situation of the family and existence of supportive elements determining the degree of these effects. In this context, variables such as parent, child and sibling relationships, model behaviors can be associated with children's aggressive behaviors. This may affect children in two ways: Firstly, developing secure attachment and empathy skills of children with hearing impairment in order to establish communication with both children with and without any disability. According to some studies, developing secure attachment and empathy skills of children with hearing impairment results in reduce aggressive behaviors (Laible, 2007; Volling, Mahoney, & Rauer, 2009; Kaplan & Aksel, 2013). Secondly, the aggressive behaviors of children will increase due to the negative approaches. Most of the children with hearing impairment are born in families with no experience related to hearing impairment. It takes some time for families to accept the situation and deal with this problem. Each family experience this process in a different weight based on their own support mechanisms. Some studies show that children, who have hearing parents, with hearing impairment experience more depression compared to their peers, who do have a parent with hearing

impairment (Turner et al., 2007; Sheppard et al., 2010). Because these children isolate themselves from the hearing world since they cannot develop a common language with their parents. Parents, who have children with hearing impairment, become more protective towards their children and they spend more effort to keep them under control. In addition, they experience more tension, conflicts in ideas and defending the opposite view and these parents force their children more to accept their own ideas and suggestions compared to other parents (Dönmez et al., 2000; Harvey & Kentish, 2010; Calderon & Greenberg, 2011). However, some other studies suggest that the communication between children with hearing impairment and their parents doesn't differentiate compared to normal children and parents develop some adaptation strategies (more visual communication) with their kids (Arıcak, 1995; Tuzgöl, 1998).

As a result, no matter what type and degree of hearing loss children have, hearing impairment negatively affects speaking, listening, understanding, language and social communication skills of these children. Therefore, first the hearing loss should be diagnosed as early as possible, the proper amplification should be provided and regular auditory rehabilitation programs and other related programs should be performed all together. Hearing impaired children can show some differences in the development process depending on the nature of hearing impairment. However, this does not mean that they are completely different from their hearing peers. Failure to create adequate opportunities for hearing impaired children to communicate with their hearing peers leads to communication problems in both groups. Therefore, social interaction between hearing and hearing impaired children should be increased and integration programs should be organized. Including parents, teachers and close friends of children showing aggressive behaviors in the treatment work conducted to treat these children are important to the success and sustainability of these studies. Putting an end to the gender discrimination in terms of child-rearing attitudes will have positive results. In every society, there are children with hearing loss and problems of these children are not much different from problems of their hearing peers. In fact, aggressive behaviors with higher prevalence seen in hearing impaired children are mostly caused by the lack of interaction between these children and their parents and environment rather than their impairment. The basic elements of social structure is understanding and being understood by others regardless of the method of communication. Based on this basic approach, particular attention should be paid for communication between hearing and hearing impaired children. In addition, reducing themes including aggression behaviors and visibility of these behaviors in the mass media will also make great contribution to prevention of these aggressive behaviors.

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