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Influences of hearing-disabled children's observational skills on their drawings

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Abstract

It is difficult to disagree with the suggestion that visual perceptive ability is the first human sense to compensate for hearing disability. In the literature, there are views that support the notion that when perceptive skills impaired in one of the senses, perceptive skills in other senses tended to be strengthened to compensate the gap in general perception. On the other hand, there are also opposing views claiming that senses work together in orchestration and so an impaired or disabled sense may result in impairment of perceptive skills as a whole at least in a partial way. The limited numbers of studies focusing on visual perception skills of children with hearing disabilities are far from consensus. This current study was inspired by these unclear and confusing views about perceptive skills of hearing-disabled. We can posit the question at this point that 'May these hearing-disabled children's visually enforced perceptive skills have influence on their observational drawing abilities?'

Keywords: hearing-disabled; hearing disability; visual perception; observational drawing skills;

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1. Introduction

Perception can be defined as cognitive response to environmental stimuli through senses (Erim, 1994). Another definition articulates that it plays role in transferring objective reality into subjective realm through senses (Ozer, 2012). In a sense, perception takes us to the reality. Perceptions are real because people believe in their perceptions (Saydam, 2005). We have to make a clear definition of perception at this context: Perception is receiving and selecting information, organizing, and then its interpretation to make one's own world more meaningful (Caglayan, 2014). An individual, from birth, uses his skills and perceptive processes to understand and interpret what is happening in the environment, and adapting himself to new conditions. Neither learning, nor behavior is possible without perception (Sarp, 2013). The nervous system has a specific sensory system or organ, dedicated to each sense. Humans have a multitude of senses. Sight (*ophthalmoception*), hearing (*audioception*), taste (*gustaoception*), smell (*olfacoception or olfacception*), and touch (*tactioception*) are the five traditionally recognized senses.

Sight and hearing are the two major human senses. We can anticipate that a problem in one of those senses that are closely related to each other, calls for an increase of need to the other one. We can anticipate that sight has the major importance between two. Seeing comes earlier than speaking. Infants learn looking and identifying earlier than talking (Berger, 1986). Our highly developed and sophisticated sight is the primary source of information from environment; and it is the major sense which is capable of sending maximum data in the fastest way possible to our neural system (Barry & Marrie, 1997).

Likewise, our hearing sense *(audioception)* makes it possible for us to perceive objects around without direct contact. Therefore, we can infer that these two senses work together in orchestration as compensating each other when needed. Accordingly, what happens to other perceptive processes, when one of the senses is impaired? When we think about a case of hearing impairment and hearing disability, we can infer that sight or visual sensory processes would work harder to compensate. Because in their situation their communicative skills rely heavily on body language and lip-reading. They have to move in spatial environment based on visual cues since they cannot hear audile stimuli.

There have been studies and resulting theories about the effects of hearing impairments on sight. In the literature, there are views that supports the notion that when perceptive skills impaired in one of the senses, perceptive skills in other senses tended to be strengthened to compensate the gap in general perception. On the other hand, there are also opposing views claiming that senses work together in orchestration and so an impaired or disabled sense may result in impairment of perceptive skills as a whole at least in a partial way (Myklebust, & Brutten, 1953; Parasnis, 1983). In the related study, to clarify whether or not hearing-disabled children's observational perceptive skills showed difference when compared to non-disabled children; Myklebust and Brutten (1953) administered tests to both groups, as the result, hearing-disabled were less successful and they inferred that it was because of the subjects' hearing disability. Likewise, Demchak and Elquist (2002) suggested that problems with eyesight were more common among subjects with hearing disability. However, other studies such as Tharpe, Ashmead, and Rothpletz (2002) showed an opposing view that visual perceptive skills of hearing-disabled children showed no difference or no negative effects when compared to their non-disabled peers. Rosenstein (1961) criticized Myklebust, & Brutten (1953)'s study and suggested that the instruments used may have been inadequate to measure perceptive performance (Parasnis, 1983). The literature regarding the issue on question is not only limited but also extant studies are far from a consensus.

2. The Purpose of the Study

Based on the literature, we concluded that there is a need to state and to describe the phenomenon regarding visual perception abilities of hearing disabled. As it was also suggested by other studies (Bottari & Pavani, 2012), the limited number of studies and the disagreements on the phenomenon support the need for further studies. Over thirty years of researches are out of consensus whether or not hearing disability affected other sensory and cognitive functions. Especially, loss of behavioral differences between hearing disabled and non-disabled individuals (Bottari & Pavani, 2012) makes it ambiguous.

Therefore, due to the ambiguity of extant studies, this study aimed to focus on influences of hearing-disabled children's observational skills on their drawings. The focus in this study is whether supposedly increased visually oriented abilities and visual-observation oriented communications of hearing disabled children have any effects on their drawings? In the study, we examined children in terms of not their artistic styles but the degree of detail and the ability to represent three-dimensional forms on their drawings; and also examined to see if any undetermined patterns exist on their drawings.

3. Methodology

The research design is structured as phenomenology. A qualitative model, phenomenology, is appropriate when the type of data consists of experiences and expressions of subjects who experience a certain phenomenon. Phenomenological studies rely on description or narration of a directly observed phenomenon.

4. Participants

The selected age group is 12-14; which is The Pseudo-Naturalistic Stage according to Lowenfeld. In this stage, children can draw objects, considering proportional relationships of forms within spatial relationships and perspective (Grandstaff, 2012). We can make comparisons and related inferences in this age period, between observation skills of experiment and control groups.

The sample group was in Nilufer district of Bursa, the fourth largest city in Turkey with a population of more than two million. Bursa is a major industrialized city located in the Western part of Turkey. The sample included experiment and control groups of total 32 students. The participants were 16 hearing-disabled students; 16 non-hearing-disabled students of the same peer group. The subjects attended a special education middle school for students with hearing disabilities. Experiment group consisted of 6-male 7th grade; 8-female 8th Grade; 2-male 8th Grade; a total number of 16 students. The control group consisted of 6 males of 7th grade; 8 females of 8th grade; 2 males of 8th grade; with total number of 16 students. The control group was selected from a typical public middle school located in another district of Bursa, Osmangazi.

5. Data Collection

The experiment and control groups were asked to draw an arrangement of four objects. The completed drawings were collected and analyzed to see the degree of success in terms of rendering predetermined criteria. Drawings were scored based on these criteria. A total score for each subject was derived to describe students' ratings in terms of their observational drawing skills. Evaluation criteria and evaluation rubric are detailed in the analysis section; subscales of rating categories are also given as a table.

The purpose of using numbers to describe qualitative measures in numbers is to support reliability of evaluation measures; minimize discrepancy of subjective evaluation criteria and bias; to make a comparison possible among emerging patterns, themes and categories; and to help a possible replication for a small scaled study (Yıldırım, 2005).

The instrument was administered to a total number of 32 students. Participation was on a voluntary-basis. Parents were informed; written parental consent forms were filled and signed by the subjects' parents. Official permissions were obtained from schools through official correspondence between principal investigator from Uludag University and the schools.

The researchers provided the drawing material. The objects needed for a still-life arrangement were decided based on characteristics of the related age group; to observe typical artistic traits of Pseudo-Naturalistic Stage. The still-life arrangement included two volcanic rocks, one wooden art form which is a partial abstraction from a human-face, and a room fragrance spray bottle –an industrial product container– as contrasting to other objects in the arrangement. The objects were distinct from each other in terms of their forms and texture. Each object had particular distinct characteristics in details. Accordingly, objects are useful in terms of rendering details to draw conclusions based on observation drawing. The students were asked to draw previously selected theme using pencils. Allocated time was 40 minutes. A total of 32 drawings were collected from hearing-disabled and non-disabled students. Hearing-disabled students had not done pencil drawings previously and this was a factor to consider in analysis process.

6. Data Analysis

Completed 32 drawings were analyzed in terms of degree of detail based on rendering realistic features and characteristics of the objects. The artistic styles of drawings are not considered since it was not focus of investigation in this study. Interpretations based on artistic style either completely omitted or kept at minimal, because it is rather a subjective aspect. Based on relevant criteria three critics analyzed and assigned scores based on a Likert scale.

The score ranges are:

The degree of rendering details in drawing based on observation;

Very Good (5); Good (4); Average (3); Less than average (2); Very little or none (1)

The criteria for scoring the drawings are:

1: Drawing all objects of arrangement; 2: Rendering details in objects; 3: Considering proportional visual cues; 4: Shading objects in drawing; 5: Rendering textures of objects; 6: Rendering realistic forms of objects; 7: Ability to use/consider perspective; 8: Shading ground surface.

Each drawing was analyzed based on these criteria, and assigned a score in Likert range. The three critics are the researchers who have undergraduate (BA) degrees in Art Education and currently pursuing MA degrees in Art Education. Each critic evaluated drawings independently to prevent any evaluation bias, and to contribute to objectivity of evaluations.

The total possible score, based on eight criteria is 40. In analysis, a score of between 25-29 is rated as 'detailed'; a score of more than 30 is rated as 'highly detailed'; and evaluated accordingly. The number and percentages of students who drew 'detailed' and 'highly detailed' in control and experiment groups were given for comparison on Table 3. In addition, percentage of students who drew highly detailed in each group was calculated, and then control group and experiment group were compared. Finally, each group was compared in terms of lowest and highest scores; related tables are given in the findings section.

7. Results

For each criterion, average scores of Non-hearing-disabled students (Control Group) and Hearing Disabled students (Experiment Group) are given on Table 1. At this point, scores for each criterion summed and total scores were calculated in terms of averages for both groups of students.

Table 1. Averages for each criterion among both groups.

	Criteria	*Non-Hearing-Disabled*	*Hearing Disabled*
1	Drawing all objects of arrangement;	5	4.87
2	Rendering Details in objects;	3.5	3.31
3	Considering proportional visual cues;	3	3.12
4	Shading objects in drawing;	2.19	2.19
5	Rendering textures of objects;	2.87	2.19
6	Rendering realistic forms of objects;	2.56	2.93
7	Ability to use/consider perspective;	3	2.75
8	Shading ground surface	2.25	2.19

Score range: 1-5

When the scores of both groups were compared (Table 1), we can see that both groups show higher scores in various criteria; however, the scores do not show a significant difference between two groups. The most distinct score difference was 0.68 within criterion 5 (Rendering textures of objects). However, we cannot come to a conclusion since none of the groups excelled significantly in a criterion.

Although, hearing-disabled students scored higher on criteria 3 and 6 (Considering proportional visual cues; Rendering realistic forms of objects), the differences between two groups are not significant. Similarly, non-hearing-disabled students scored higher on the other criteria (1, 2, 5, 7, and 8); nevertheless, even one student's individual score affects the gap between the groups because of the sample size. For instance, for criterion 1 (Drawing all objects of arrangement) all of the non-hearing-disabled students received the highest score; on the other hand, all of the hearing-disabled students received the highest but only one received a very low score (3) and decreased the averages significantly. There could be many reasons for this one student to not draw all objects, so we cannot compare or generalize this group's success rate at this scale. We can come to a similar conclusion based on non-hearing-disabled students' scores that are higher in various criteria. The most noticeable score difference is with 0.68 in criterion 5 (Rendering textures of objects). These similar disparities of scores among both groups, makes a direct inference ineffective.

Table 2 shows numbers and percentages of students in both groups who rendered arrangement in 'detailed' way (score range: 25-40).

Table 2. Degree of detail in drawings among groups.

Group	*Number of students who drew as 'detailed'*	*Percentage*
Non-Hearing Disabled Students	10	62.5%
Hearing-Disabled Students	9	56.25%

Score range: 25-40

6.25 % difference between two groups is not significant to make an inference since sample size is small and it means only one student difference between groups.

Table 3 below, shows the numbers and percentages of students among groups who drew 'highly detailed' (score range: 30-40); and the percentage of 'highly detailed' drawings among 'detailed' drawings in particular.

Table 3. Degree of detail in drawings among Hearing-Disabled and Non-Hearing-Disabled students.

	Percentage of Detailed Drawings	*Number of Detailed Drawings*	*Percentage of Highly Detailed Drawings*	*Number of Highly Detailed Drawings*
Degree of Detail in drawings among Non-Hearing Disabled	62.5%	10	50%	5
Degree of Detail in drawings among Hearing Disabled	56.25%	9	55.5%	5

As seen on Table 3, number of 'highly detailed' drawings in both groups is 5. The lowest and the highest scores of drawings among groups, in terms of degree of detail are shown on Table 4.

Table 4. The lowest and highest scores of drawings in terms of degree of detail.

Group	*Highest Score*	*Lowest Score*
Non-Hearing Disabled Students	36	13
Hearing-Disabled Students	39	17

Score range: 8-40

What we see on Table 4. is the lowest and the highest scores of hearing-disabled students are higher than their non-hearing-disabled peers. It could be critical information that it was the first experience for hearing-disabled students and they had not drew a still life before. However, we still cannot describe or generalize these numbers as visual perceptual abilities of hearing-disabled students are at a superior level than their non-hearing-disabled peers. Nevertheless, current results do not support Mykelbust and Brutten (1953)'s implication that hearing-disabled individuals' visual perceptual abilities are lower compared to non-hearing-disabled individuals. Our findings support Tharpe, Ashmead and Rothpletz (2002)'s findings that hearing-disabled children's visual perceptual abilities were not different in a negative way when compared to their peers.

8. Conclusion

There are limited studies and conflicting views in the literature about the effects of impairment on the hearing (*audioception*). The extant studies show inconsistent results, and number of studies is limited. Therefore, we are far from consensus at this point, for generalization (Bonmassar, 2015). Our study supports Tharpe, Ashmead and Rothpletz (2002)'s findings; on the other hand, it is in disagreement with the view that hearing disability causes impairment in visual perceptive skills (Myklebust & Brutten, 1953). Further studies needed to contribute to the literature and will possibly clarify the effects of hearing disability on visual perception, if there is any.

9. Recommendations

The study was conducted in districts of Bursa, Turkey. The still life drawing was one sitting session of 40 minutes. Similar studies could be replicated with more sessions, longer time time-periods, with drawings of more than one still-life arrangements. Similarly, uses of various media, in addition to drawing pencils are recommended. Pencils are mostly limited to drawings and use of colors may yield to other results as well. Further studies may focus on the uses and effects of colors to consider hearing-disabled individual's visual perception. Bueno, Garcia, and Mendonca (2013) studied colors' effects on the visual perception of hearing-disabled; however, their findings are ambiguous and limited for a conclusion.

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