

Full Length Research Paper

High school students' metaphors towards "climate" concept according to gender variable

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This research was carried out to determine the metaphors of high school students towards "climate" concept according to gender variable. A total of 108 students in two high schools in Karabük City participated in the research in 2009 - 2010 academic years. The data of the research were gathered from the students' completing the expressions: "climate is like ... because..." The analysis and interpretation of the collected data was done using the phenomenologic science design and content analysis technique of qualitative research method. According to the findings of the research, the schoolgirls and boys produced 21 and 26 valid metaphors related to "climate" concept respectively. These metaphors were separated into different conceptual categories of 7 for schoolgirls and 8 for the schoolboys according to their common features. At the end of the research, it was discovered that two concepts were used most frequently, 42.84% of the schoolgirl's think of "climate" concept as an expression of change and 14.28% as an expression of life. From the schoolboys, two conceptual categories had the most frequency of 44.27% that of "climate" concept as an expression of change and 16.31% as an expression of ambiguity. Schoolboys formed more metaphors and conceptual categories than schoolgirls. This condition may be an indication that schoolboys perceive the "climate" concept as a wide and abstract concept.

Key words: Climate education, metaphor, gender, student, geography education.

INTRODUCTION

Recently, either in Turkey (Oğuz, 2005; Arslan and Bayrakçı, 2006; Öztürk, 2007; Semerci, 2007; Güven, 2008; Cerit, 2008; Saban, 2004; 2008; 2009; Güven and Güven, 2009) or abroad (Lakoff and Johnson, 1980; 2005; Taylor, 1984; Morgan, 1998; Inbar, 1996; Palmquist, 2001; Yob, 2003; Pishghadam et al., 2009; Pishghadam and Navari, 2010) there have been quantitative, qualitative and both quantitative and qualitative studies carried out about metaphors except related books. In his study, Saban shared the idea that there was a perspective especially based on Lakoff and Johnson's (1980; 2005) studies which was called "theory of metaphors" and if our concept system was metaphorical to a great extent as Lakoff and Johnson claimed then the way we think, every phenomenon we experience and our daily activities should be metaphorical in a way. Salman (2003) claimed that the term "metaphor" comes from the root word "metafora" in Latin and Greek and consisted of the combination of two

words; meta (over, other) and pherein (carry, load) and it is used today as "rhetoric". Main functions of metaphors are gathering too much knowledge and data, interpreting them, spread out to others with the aim of overcoming ambiguity (Erdem and Şatir, 2000). Palmquist (2001) stated that metaphors are linguistic devices that tie two different ideas, objects or concepts to each other, the concepts are compared and related to a symbolic language structure and those metaphors are faced as names, action or attribution in daily speech. Metaphors are elements that are used for explaining human life, natural and cultural environment and phenomena in terms of figurative speech.

Metaphor provides a comparison between two events, phenomena, themes or concepts and presents the similarities among them in a figurative way. Thus the similarities between two things are noticeable or are given the opportunity to interchange one another. The expression "The Empire of climate is the first of all empires"

is a figurative expression. In this statement “climate” represents empire and emphasizes that the biggest empire is the climate empire. Montesquieu emphasized that the phenomena “weather” affect natural environment and used figurative speech to represent the behaviour of weather phenomena in a region, its wide spread character for long years, its influence and control over everything mainly human beings represent empire. He notified climate’s dimensions that represent empire and used the metaphor “emperor” for climate.

In metaphors, resembling, corresponding and the relationship between them are the three important titles. In the example above the resembling is *climate*, *empire* is its correspondence. The relationship is the metaphor, in other words, the resembling concept refers to its corresponding concept. This situation gives clues not only about how the individual perceives the resembling concept but also about the individual’s learning history, environment, background about the subject, his/her ability to use language and his/her point of view. Saban (2004) quoted from Forceville’s research (2002) and has pointed out that the metaphor must have at least three elements in the form of subject -source and attributed features. Metaphors, which attracted the attention of educators in recent years, have been a subject in various researches both in local and foreign literature. Three researches which have been carried out in recent years include:

Güven and Güven (2009) in their study have aimed at determining whether students’ situations for making metaphors referring to the subject of social studies differ according to their gender, their likes or dislikes for the lesson, their level of grade and the school where they are educated. In their research, they collected data from 564 students who were attending the 4th and 5th grades at primary school in the city of Canakkale. They first asked every student who took part in the research to write down their opinions about the subject of social studies and then to complete the statement: “Social studies are like ... because in this lesson, the most ...” At the beginning, they made an analysis with the quantitative method by using the content analysis technique and then by quantifying the data related to this research. In the end, they reached the result that primary school students are affected by their gender, their grade level, and their likes or dislikes for the lesson in their metaphor constitution but the school where they receive education, does not have any effect on their status for making up a metaphor.

Saban (2009) in his research dealt with 2847 teacher candidates’ metaphors about the “student” concept. The participants in this research were requested to complete the statement: “A student is like ... because ...” He analyzed the research data by using the techniques of content analysis and the quantitative analysis. According to the result of the research, the teacher candidates produced 156 valid metaphors in relation to the “student” concept. These metaphors in relation to their common features have been categorized under 11 different conceptual

categories. The conceptual categories have shown important differences in terms of the teacher candidates’ education programmes, their gender, and their grade level.

As for the geography education, one research has been made so far and the study was published in 2007 by Öztürk. Öztürk explained the purpose of his research as determining the perceptions of the teacher candidates on who will teach geography as a social studies teacher, a science teacher or a primary school teacher at elementary level using metaphors. A total of 357 senior class students at Ahi Evran University, education faculty, participated in this research. The research data was completed using the statement: “Geography is like ... because...” The content analysis technique was practised on the data and the results were evaluated. At the end of the research it was seen that 33% of the teacher candidates perceived geography as the sources of life, 23.2% see it as the life area, 8.1% see it as a path finder, and 7.5% perceived it as something made up of different branches. 56% of the students, who took part in the research, defined it as life itself.

The first research about the metaphor in geography education was made in 2007 but it did not attract much attention. The use of metaphors is very important in geography education as it is in every field. In geography education, this study is the first one which puts gender variant into consideration.

PURPOSE OF THE STUDY

The purpose of this research is to find out the perception of high school students about the concept of “climate” through their metaphors. The following questions try to elicit answers to the framework of this general purpose:

1. Through which metaphors do the schoolboys and schoolgirls at high schools, show their perception of “climate”?
2. Under which conceptual categories are the schoolgirls’ metaphors gathered when their common features are considered?
3. Under which conceptual categories are the schoolboys’ metaphors gathered when their common features are taken into consideration?
4. Are the schoolboys and schoolgirls’ metaphors and conceptual categories in relation to the concept of “climate” different from each other?

METHOD

Research design

In the research, for determining the metaphors which students constitute to express their opinions in relation to the concept of “climate” which takes place in the topics of geography, the qualitative research method with scientific design, which ensures

Table 1. The students' distribution of frequency and percentage regarding their gender.

Gender	Frequency (f)	Percentage (%)
Female	55	51
Male	53	49
Total	108	100

the production of more detailed and abundant information about human beings and situations, were used and as for the analysis of the data, the content analysis technique was used. Yıldırım and Şimşek (2005) have pointed out that the basic aim of the content analysis was to reach the relations and concepts which can explain the data that were collected, summed up and evaluated in descriptive analysis and can be processed more deeply through content analysis. they also noted that the concepts and themes which were not noticed via descriptive analysis were reached through this analysis and that the process in the base of content analysis was to put together the data which resembled each other in the framework of certain concepts and themes and to organise and evaluate them in a way that they can be understandable by the reader.

Study group

A total of 108 students who attends two high schools in the city of Karabük in 2009 - 2010 education year, took part in the research. The students' frequency distributions and percentage according to their gender are shown in Table 1. As can be seen in Table 1, among 108 students; 55 of the students who took part in the research were female students while the remaining 53 were male students constituting 51 and 49 %.

The collection of the research data

So as to determine the perception of high school students regarding the concept of "climate" in geography lesson, each of the students were asked to complete the statement: "The climate is like ... because ...". For this purpose each student was given a sheet of paper containing instructions on what to do at the top of the page and the statement "climate is like ... because ..." written under it. In the instructions part, students were asked to focus on just one metaphor and write down their opinions about it.

The analysis and the evaluation of the data

The analysis and the evaluation of the metaphors that students have developed, took place in five phases:

1. Coding and clearing up phase,
2. Collecting the metaphor samples,
3. Category development,
4. Ensuring validity and reliance,
5. Loading the data into computer.

Coding and clearing up phase

According to the purpose of the research, it was checked if the metaphors were clearly expressed in the students' writings. The metaphor in every student's paper was coded (For instance;

human, chameleon, life etc...). The papers in which any metaphors were not written, the ones which used metaphors but do not have any reasons, and the ones discussing the feature of climate concept, were marked. Due to the reasons mentioned above, 23 papers were eliminated and left out of the study.

Collecting the metaphor samples

In this phase, due to having an image but not having any reason in a student's paper; having a discussion about the concept of climate in three students' papers; and having no connection between the resembling metaphor and the resembled image in 19 students' papers, a total of 23 papers were eliminated and left out of the research. So 85 papers were accepted and analyzed in this research. After revising the students' papers of which some had weak metaphors, their papers were classified according to the students' gender. 21 valid images from female students and 26 from male students were collected in total. Thus, with the collection of the best representatives for each metaphor a sample image list was made for both male and female students: This list was made due to two reasons:

- (a) To be used as a reference source for gathering the metaphors under one category.
- (b) To validate the process of data analysis and evaluation.

The Development of categories

The images which were produced by the students were studied according to the common features that they have regarding to the "climate" concept. During this process, the metaphor list, especially those made about male and female students' metaphors were taken into consideration and every metaphor was studied in terms of how they conceptualize the "climate" concept. According to the aim of this phase, every metaphor produced by the students was connected with the viewpoint regarding the "climate" concept. Therefore seven different conceptual categories for female students and eight different conceptual categories for male students were formed.

The level of sustaining validity and reliability

Validity and reliability are the two vital criteria that were used to indicate persuasiveness of the result of a study (Yıldırım and Şimşek, 2005). To guarantee the persuasiveness of the study, experts were consulted about whether the metaphors given under conceptual categories 7 of the schoolgirls, and 8 of the schoolboys in the study represent the mentioned category. According to the aim of this level, 4 lists were given to the expert:

1. List in which there are 21 items of metaphors which were put in a row according to alphabetic order (schoolgirls).
2. List in which 7 items of conceptual category's names and features (schoolgirls) were included.
3. List in which there were 26 items of metaphors which were put in a row according to alphabetic order (schoolboys).
4. List containing the names and features of conceptual categories (schoolboys).

The expert was expected to match the metaphors in the first list for the schoolgirls with the conceptual categories in the second list (all the metaphors will be matched) by means of 4 lists. The same thing was made for the schoolboys. Then the match made by the expert was compared with the categories created by the researcher. In these comparisons the number of agreeing and disagreeing

Table 2. Valid metaphors that were formed by schoolgirls about “climate” concept, their referring number of students and percentage.

Gender	Order of metaphors	Names of the metaphors	Frequency (f)	Percentage (%)
Female	1	Human Being	11	26.18
	2	Life	5	11.9
	3	Weather	4	9.52
	4	Chamelon	3	7.14
	5	Living	2	4.76
	6	Love	2	4.76
	7	Flower	1	2.38
	8	Lollipop	1	2.38
	9	Light	1	2.38
	10	Colours	1	2.38
	11	Nature	1	2.38
	12	Colourful Life	1	2.38
	13	Clothes	1	2.38
	14	Breast milk	1	2.38
	15	Wind	1	2.38
	16	Genetics	1	2.38
	17	Water	1	2.38
	18	Breath	1	2.38
	19	Soil	1	2.38
	20	Rain	1	2.38
	21	Light	1	2.38
	Total:	21 Metaphors	42 (f)	100

numbers were noted. The persuasiveness of the study was estimated by using the formula created by Miles and Huberman (1994) (Persuasiveness: Agreeing ideas/agreeing + disagreeing ideas).

In qualitative studies, if the harmony between the evaluation of the expert and researcher were at 90% or over, it is accepted as persuasive at an accepted level (Saban et al., 2006; Saban, 2008; Saban, 2009). We obtained 93% persuasive level of success in the study. The consulted expert put a metaphor in schoolgirls (air) in a different category which was different from the researcher. Thus persuasiveness was $21 / (21+1) : 0.95$. In schoolboy's category, the expert put two different metaphors differently from the researcher. Thus persuasiveness was $26 / (26 + 2) = 0.93$.

The stage of putting the data in computer

After totally determining the metaphors 21 for schoolgirls and 26 for schoolschoolboys and developing 7 conceptual categories for schoolgirls and 8 for schoolschoolboys, all the data were put into computer programme. After this stage the numbers of participants (f) and their percentage (%) reflecting metaphors and categories for schoolgirls and schoolboys were calculated.

FINDINGS

In this part, there are findings consisting of metaphors that schoolboys and schoolgirls as participants developed towards “climate” concept. The findings were analyzed

and interpreted under four headings according to the research questions that were stated in the “purpose of the study” part.

Through which metaphors do the schoolgirls and schoolboys put forth their perceptions about “climate” concept?

Schoolgirls in high schools formed 21 valid metaphors towards “climate” concept. 15 of the 21 valid metaphors was produced by one student. These are; flower, lollipop, enlightened, colours, nature, colourful life, clothes, breast milk, wind, genetics, water, breath, soil, rain and light. The rest of the metaphors have varied frequencies between 2 to 11. The most frequent metaphors mostly stated by schoolgirls towards climate were; human being (f = 11), life (f = 5), weather (f = 4), chamelon (f = 3), life and love (f = 2). As earlier noted, the schoolgirls used a number of metaphors related to “climate” concept. In Table 2 the metaphors produced by the participating schoolgirls were put in order according to their frequencies. Each metaphor and the referring number of students (frequency) and its percentage (%) was stated.

The schoolboys in high school formed 26 acceptable metaphors about the image of “climate”. 17 out of 26

metaphors created by the schoolboys were formed by just one student. These were sandclock, my father, X-Y, existence, oxygen, guest, X, difference, Z, ball, opposite, father, hypocrisy, raining, cover, a place name and a tool. The other metaphors has a frequency ranging between 2 and 6. The most repeated metaphors about the climate by the schoolboys were human being (f=6), chameleon and life (f=4), living, weather, schoolgirl, love, nature and season (f = 2).

As seen in Table 2, the schoolboys used lots of metaphors about "climate" concept. In Table 3, the metaphors were listed according to their frequencies as produced by the schoolboys that participated in the research. Also the number of students (frequency) that represent each metaphor and percentage were stated.

When the common features of metaphors that were formed by schoolgirls were taken into consideration, under which categories can these metaphors be classified?

The metaphors that schoolgirls have about "climate" concept were divided into 7 categories. When the categories were examined, the category that has the most frequent metaphors was "climate as the expression of change". In this category, there were 18 metaphors in total such as; human being, chameleon, love, clothes and lollipop. The second category that had fewer metaphors than the first one was "climate as the expression of life". In this category there were 6 metaphors on; life and soil. There were two categories on the third category and they have 5 metaphors. These were "climate as the expression of science" and "climate as the expression of necessity." The metaphors in "climate as the expression of science" category were weather and nature. Their total frequency was 5. In "climate as the expression of necessity" category, there were metaphors like breast milk, genetics, water, breath and light. Total frequency for this category was 5 as well. Other categories were numbered from the most to the least as follows "climate as the expression of variation" (f = 4), "climate as the expression of ambiguity" (f = 2) and "climate as the expression of natural events" (f = 2), the metaphor categories that schoolgirls have about "climate" concept were given in Table 4.

CONCEPTUAL CATEGORIES

Category 1

Climate as the expression of change

According to Table 4 there were 5 metaphors in "climate as the expression of change" category. These metaphors were brought forth by 18 schoolgirls (42, 84%). When we

examined the distribution of metaphors in this category, the most frequent ones were; human being (11), chameleon (3), love (2), clothes (1) and lollipop (1). The following were examples given by the schoolgirls of this category:

1. "Climate is like human beings because as every human being of a region is different, its climate is different as well."
2. "Climate is like a chameleon since climate changes as the chameleon does."
3. "Climate is like love because every love lives its own story. Every climate experiences its own natural events."

Category 2

Climate as the expression of science

According to Table 4 there were 2 metaphors in "climate as the expression of science" category. These 2 metaphors were brought forth by 5 schoolgirls (11, 9%). When we examined the distribution of metaphors in this category, the most frequent ones were weather (4) and nature (1). The following is an example given by the schoolgirls of this category:

"Climate is like weather because climate is the analysis of weather conditions in nature. The temperature of the air; raining, snowing, and such events are related to climate."

Category 3

Climate as the expression of life

According to Table 4 there were 2 metaphors in "climate as the expression of life" category. These 2 metaphors were brought forth by 6 schoolgirls (14, 28%). When we examined the distribution of metaphors in this category, the most frequent ones were life (5) and soil (1). The following were examples given by the schoolgirls of this category:

1. "Climate is like life because we know yesterday, we live today but we can not know tomorrow. Climate is something like that, we know yesterday's and today's weather but our tomorrow is unknown"
2. "Climate is like existence because in order to grow crops there should be some particular climatic conditions. There would be no life where the climate is bad."

Category 4

Climate as the expression of ambiguity

According to Table 4 one mental metaphor holds place in

Table 3. Valid metaphors that were formed by schoolboys about “climate” concept, their referring number of students and percentage.

Gender	Order of metaphors	Names of the metaphors	Frequency (f)	Percentage (%)
Male	1	Human Being	6	13.98
	2	Chamelon	4	9.32
	3	Life	4	9.32
	4	Weather	2	4.66
	5	Love	2	4.66
	6	Girl	2	4.66
	7	Living	2	4.66
	8	Nature	2	4.66
	9	Season	2	4.66
	10	Sandclock	1	2.33
	11	My Father	1	2.33
	12	X,Y	1	2.33
	13	existence	1	2.33
	14	Oxygen	1	2.33
	15	Guest	1	2.33
	16	X	1	2.33
	17	Variation	1	2.33
	18	Z	1	2.33
	19	Ball	1	2.33
	20	Opposite	1	2.33
	21	Father	1	2.33
	22	Hypocrisy	1	2.33
	23	Rain	1	2.33
	24	Covering	1	2.33
	25	A Name of a Place	1	2.33
	26	Device	1	2.33
		Total: 26 Metaphors	43 (f)	100 (%)

Table 4. Metaphor categories of schoolgirls towards “climate” concept.

Categories	Metaphors	Metaphors		Number of Metaphors
		(f)	(%)	
1. Climate as the expression of change	Clothes, human being, love, lollipop, chamelon,	18	42.84	5
2. Climate as the expression of science	Weather, nature	5	11.9	2
3. Climate as the expression of life	Life, soil	6	14.8	2
4. Climate as the expression of ambiguity	Living	2	4.76	1
5. Climate as the expression of variation	Flower, Light, colours, colourful life	4	9.52	4
6. Climate as the expression of necessity	Breast, milk, genetics, water, breath, light	5	11.9	5
7. Climate as the expression of natural events	Wind, rain	2	4.76	2
Total		42	100	21

the category of “Climate as expression of ambiguity.” This one metaphor was brought forth by two schoolgirls (4,

76%). The following were examples given by the schoolgirls of this category:

1. "Climate is like life because climate enables us to live natural events. I cannot imagine life without climate. I consider climate and those events caused by it as my heart and life. I see climate as my life."
2. "Climate is like life since it is unpredictable. It may rain all of a sudden while it is sunny. It is not certain at some times."

Category 5

Climate as the expression of variety

Going through Table 4, four mental metaphors hold place in the category of "Climate as expression of variety". These four metaphors were brought forth by four students (9, 52%). The frequency distributions of these metaphors were as follows flowers (1), colours (1), colourful life (1), and luminousness (1). The following were examples given by the schoolgirls of this category:

1. "Climate is like flowers because it is in all shapes and sizes."
2. "Climate is like colours because each colour has a different meaning in different situation and place alike. Climate varies in every continent, from season to season."

Category 6

Climate as the expression of necessity

There were 5 metaphors in the category of "Climate as expression of necessity". These five metaphors were brought forth by five students (11, 9%). When the frequency distribution of the metaphors in this category was examined the most frequent ones were human breast milk (1), genetics (1), water (1), breath (1), and light (1). The following were examples given by the schoolgirls of this category:

1. "Climate is like light. It is the *sine qua non* in every condition."
2. "Climate is like breath. No one could live without breath, though. But for climate, we would not know what to wear and when to wear what, which might affect us badly. It would be hard to live as well as we could not live without breath."
3. "Climate is like water because it is something different and every place needs it. It keeps natural events in order. I think that there cannot be life without water. I associate climate with water without which we cannot make it"

Category 7

Climate as the expression of natural events

There were 2 metaphors in the category of "Climate as

expression of natural events". Three students made up the two metaphors (3, 41%) When the frequency distribution of the metaphors in this category was examined, the most frequent ones were rain (1), wind (1).

The following were examples given by the schoolgirls of this category:

"Climate is like wind because the weather is cloudy at one time and clear at another. It may shift quickly."

Under which conceptual categories do the metaphors made up by schoolboys go if one takes common properties of those metaphors into consideration?

The metaphors were divided into eight categories. The category with the most frequency distribution was "Climate as an expression of change", in which there were 19 metaphors such as human, chameleon, love, my daddy, schoolgirl, X-Y, ball, X and a name of a place. The category with the second most frequency distribution was "Climate as an expression of ambiguity" in which there were 7 metaphors such as guest, life, Z, and hypocrisy. The third category in the rank with the most frequency distribution was "Climate as an expression of science". In this category 5 metaphors such as vegetation, weather and nature were used. The other categories can be ranked with regards to the frequency as follows: "Climate as an expression of variety" (f = 4), "Climate as an expression of life" (f = 3), "Climate as an expression of necessity" (f = 3), "Climate as an expression of natural events" (f = 1), and "Climate as an expression of continuity" (f = 1).

The metaphors related to climate made up by schoolboys were shown on Table 5.

CONCEPTUAL CATEGORIES

Category 1

"Climate as the expression of change"

When Table 5 was examined in "Climate as the expression of Change" category, there were nine metaphors. 19 schoolboys (44,27 %) formed 9 metaphors about climate concept. When the frequency distribution of the metaphors in this category was examined the most frequent ones were human beings (6), chameleon (4), love (2), my father (1), X-Y (1), X (1), ball (1) and a place name (1). The following were the metaphor examples belonging to this category:

1. "Climate is like a human being because it is changeable as humans. Not all the humans are the same. There are good ones and bad ones. Climate is just like that. Climate has variation, too. That region is fine then, every-

Table 5. Metaphor categories of schoolboys towards “climate” concept.

Categories	Metaphors	Metaphors		Number of metaphor
		(f)	(%)	
Climate as the expression of change	Chamelon, human being, love, my father, girl, X-Y, X ,ball, a place name	19	44.27	9
Climate as the expression of science	Covering, Weather, nature	5	11.65	3
Climate as the expression of life	Life, existence	3	6.99	2
Climate as the expression of ambiguity	Guest, Living, Z, hypocrisyness	7	16.31	4
Climate as the expression of variation	Variation, opposite, season	4	9.32	3
Climate as the expression of necessity	Oxygen, father, device	3	6.99	3
Climate as the expression of natural events	Rrain	1	2.33	1
Climate as the expression of sustainability	Sandclock	1	2.33	1
Total		43	100	26

thing can be grown up. Nothing can be harvested in some regions. Such a climate is useless then. ”

2. “Climate is like a chamelon because it gets formed according to its natural environment.”
3. Climate is like a schoolgirl because it is not possible to guess what she does.”
4. Climate is like love because once it burns, once it cools. We get burnt in summer, We catch a cold when it is winter.”

Category 2

Climate as the expression of science

When we examined Table 5, it was seen that “Climate as the expression of Science” category had 3 metaphors. 3 metaphors about “climate” were formed by 5 boys (11,65 %). When we examined the distribution of metaphors in this category the most frequent metaphors used were nature (2), weather (2) and covering (1). The following metaphors were examples made by schoolboys belonging to this category:

1. “Climate is like nature because it reflects features of a region, forms, soils and trees are in connection with climate.”
2. “Climate is like weather because climate changes occur according to weather conditions.”

Category 3

Climate as the expression of life

When we examined Table 5, in “Climate as the expression of life” category, there were 2 metaphors. 2 metaphors about “climate” were formed by 3 schoolboys (6,99%). When we examined the distribution of metaphors in this category the most frequent metaphors used were life (2) and existence (1). The following metaphors were examples made by schoolboys belonging to:

“Climate is like life because what determines our way of life is climate. Human beings survive according to the climate conditions.”

“Climate is like existence because in order to grow crops there should be some particular climatic conditions. There would be no life where the climate is bad.”

Category 4

Climate as the expression of ambiguity

According to Table 5, four mental metaphors held place in the category of “Climate as expression of ambiguity.” 4 metaphors were brought forth by seven schoolboys (16, 31%) about climate concept. The most frequent metaphors used were life (4), guest (1), Z (1) and hypocrisy. The following metaphors were examples made by schoolboys belonging to this category:

1. “Climate is like life because it is not predicted what happens and when”.
2. “Climate is like a guest since it is unpredictable to guess when to come.

Category 5

Climate as the expression of variation

When we examined Table 5, in “Climate as the expression of variation” category, there were 2 metaphors.

4 metaphors about “climate” were formed by 4 students (9,32%). When we examined the distribution of metaphors in this category, the most frequent metaphors used were seasons (2), variation (2) and adverse (1). The following metaphors were examples made by schoolboys belonging to this category:

“Climate is like seasons because climate is consisted of varied weather conditions. As seasons are formed by va-

ried weather conditions climate is an equal concept with seasons.”

Category 6

Climate as the expression of necessity

When we examined Table 5, in “Climate as the expression of necessity” category, there were 3 metaphors. 3 metaphors about “climate” were formed by 3 students (6,99 %). When we examined the distribution of metaphors in this category, the metaphors used were oxygen (1), father (1) and device (1). The following metaphors were examples made by schoolboys belonging to this category:

“Climate is like oxygen because it is not possible to survive without oxygen and it is not possible to survive unavailable climatic conditions as well.”

Category 7

Climate as the expression of natural events

When we examined Table 5, in “Climate as the expression of natural events” category, there was one metaphor. 1 metaphor about “climate” was formed by 1 student (2,33 %). The metaphor stated was rain. The following metaphor was an example made by a schoolboy belonging to this category:

“Climate is like rain because it is possible to get some knowledge. It contains vegetation, geographical formations and such features. Rain is vital for all living things”

Category 8

Climate as the expression of sustainability

When we examined Table 5, in “Climate as the expression of sustainability” category, there was one metaphor. A metaphor about “climate” was formed by 1 student (2,33 %). The metaphor used in this category was hourglass (1). The following metaphor was an example made by a schoolboy belonging to this category:

“Climate is like an hourglass. When you empty the hour glass, it fills again. Then when you turn it upside down, the same things happen. Climate is such a recycling.”

Are the metaphors and conceptual categories formed by schoolboys and schoolgirls towards “climate” concept different?

It was realized that of all the metaphors that were formed by schoolboys and schoolgirls towards “climate” concept, schoolgirls produced 21, and schoolboys produced 26

metaphors. 8 of the metaphors (human being, chamelon, love, weather, nature, life, living and rain) that were formed by schoolboys and schoolgirls were common and 31 of them were different. 13 of these metaphors were produced by schoolgirls and 18 by the schoolboys.

The conceptual categories of metaphors that were produced by students were the same except for one (climate as the expression of sustainability). Schoolgirls preferred climate as the expression of change and as the expression of life, while schoolboys preferred it as the expression of change, the expression of science and the expression of ambiguity. Schoolboys used more metaphors than schoolgirls in the expression of change; the expression of science and the expression of ambiguity categories. Schoolgirls produced more metaphors in climate as the expression of variation, expression of necessity and expression of natural events categories than schoolboys. Both schoolboys and schoolgirls formed equal metaphors in climate as the expression of life category. Also, schoolboys had one more conceptual category than schoolgirls. Metaphors and conceptual categories of schoolboys and schoolgirls towards “climate” concept are shown in Table 6.

DISCUSSION AND CONCLUSIONS

This aim of the research was to put forth the metaphors that high school students have about “climate” concept, classify them under particular conceptual categories and compare them. The findings of this research were as follows: Some of the concepts that were involved in geography were abstract and were difficult to perceive by the students. Concepts like climate, weather conditions, humidity, relative humidity, specific humidity, pressure, high pressure, low pressure, normal pressure, temperature and heat were such examples of climate. The accurate comprehension of such concepts by the students can be possible by using metaphors. If the teacher uses valid metaphors in the teaching process the students comprehend well and do not forget the theme. It is because of this that, Saban A, Koçbeker BN, Saban A (2005) examined mental imaging as forming relations between abstract concepts and known concrete things.

Since “climate” is an abstract concept it cannot be explained as a whole. Hence it is necessary to use lots of metaphors. In this study both schoolgirls and schoolboys defined climate as: “human being”, “chamelon”, “life”, “living”, “weather” and “love” and also defined as “rain”, “guest”, “existence”, “wind”, “breathe”, “season”, “oxygen”, “colours”, “soil”, “light” and “father” as well. This showed that climate are made up of many concepts and can not be explained using only one metaphor as a whole. There were similarities between climate that can not be explained using one metaphor and consisting of lots of concepts. For example Öztürk’s (2007) study about geography over primary teaching, science teaching and social sciences teaching department students.

Table 6. Metaphor categories of school boys and schoolgirls towards “climate” concept.

Categories	Metaphors	
	Schoolgirls	Schoolboys
Climate as the expression of change	Clothes, human being, love, lolipop, chamelon,	Chamelon, human being, love, my father, girl, X-Y, X ,ball, a place name
Climate as the expression of science	Weather, nature	Covering, weather, nature
Climate as the expression of life	Life, soil	Life, existance
Climate as the expression of ambiguity	Living	Guest, living, Z, hypocrisyness
Climate as the expression of variation	Flower, Light, colours, colourful life	Variation, opposite, season
Climate as the expression of necessity	Breast milk, genetics, water, breath, light	Oxygen, father, device
Climate as the expression of natural events	wind, rain	Rrain
Climate as the expression of sustainability	-	Sandclock

Peculiar to this study when the metaphors of schoolboys and schoolgirls towards “climate” concept were examined, schoolboys produced more metaphors than schoolgirls. In forming conceptual categories, schoolboys had one more category than schoolgirls. This may show that “climate” concept are perceived abstractly by schoolboys. This is because Yob (2003) states that metaphors are strong means of comprehending and explaining high level abstract, complex or theoretical phenomenons. When we examined the metaphors of schoolgirls and schoolboys towards “climate” concept, the most frequent metaphors preferred by schoolgirls were human beings ($f = 11$), life ($f = 5$), weather ($f = 4$) and chamelon ($f = 3$). Schoolboys preferred human being ($f = 11$), chamelon ($f = 4$) and life ($f = 4$) the most. This showed that schoolgirls reflected change as they produced human being and chamelon metaphors for “climate”, they associated life as being in close relation with life, while associating weather for climate concept they reflected its scientific feature. Schoolboys associated “climate” concept with human being and chamelon just as schoolgirls, they reflected the idea of change associating it with life and emphasizing its ambiguity as not being able to guess the future exactly.

The common result taken from both the schoolgirls and schoolboys showed the changeability of climatic conditions from one place to another emphasized in terms of metaphors. Besides schoolgirls perception of climate as a part of life is seen to be scientific and is thought to be a necessity for life. Schoolboys perceive climate not only with its changeability but also with its ambiguity. They perceive it as a concept that is unguessable, of scientific content but has variations to some extent. While schoolgirls think “climate” as a necessity of life, schoolboys find it ambiguous and varied.

Climate is a field of study under physical geography subfields. Oliver and Hidore (2002) stated that in time periods, as years or long terms the studies that were exhibited by atmospheric conditions were climatology (Climate science). Atalay (2004) claimed that average data belonged to a long term (30 to 50 years) weather

conditions in a region. Şahin (2005) stated that it is the average weather conditions and their features in a long period that are measured regularly in a place in the world. Ünaldi (2009) claimed that the weather conditions in a place for long periods of time were called climate as a whole and it consists of not only average but also extreme values. When field specialists’ definitions about “climate” were examined time, place, measuring, periods, vitality and environmental conditions were highlighted concepts although schoolboys and schoolgirls’ metaphors towards “climate” concept do not overlap exactly with the concepts that were emphasized in climate definitions in books, they had some common points. Among the schoolboys and schoolgirls’ metaphors “climate” concept corresponded to such concepts as rain, wind or season and may be proof that they could not understand the difference between climatic conditions and concepts earlier given. Students gave some metaphors about climate factors such as teacher sufficiency, curriculum, lesson books, social background, students’ interests, visual-script pres, socio-economic conditions, and psychological mood. When the categoric distribution of students’ metaphors about “climate” concept was examined, it was given as an expression of change, science, life, sometimes ambiguity, variation, necessity, natural events and sustainability. Students did not produce metaphors like sustainability and natural events and these categories are of crucial importance in climate.

As a result the findings of this research were put forth on how schoolboys and schoolgirls perceive climate concept at the same classroom atmosphere. It is possible to realize the students’ metaphors towards “climate” concept change according to their gender. Despite the fact that they have similar conceptual categories, the number of metaphors and their frequencies vary. Metaphors, as a research tool, were used in determining and explaining perceptions that high school students have about “climate” concept. Thus in designing geography curriculum and preparing coursebooks, student metaphors and such researches will be significant guides. This is because in learning complex or abstract concepts, va-

lid and accurate metaphors are necessary. Semerci (2007) stated that educational metaphors are preferred tools in explaining complex concepts and phenomena. Based on this point, such researches have been suggested to be carried out on similar studies in different types of high schools (Science high schools, Anatolian High schools, social sciences high schools, and vocational high schools), by student teachers from education departments of universities. Also in metaphor studies beside gender, some other variants like class should be researched. This is because the comprehension of metaphors and their successful application in schools depend on the abundance of such studies.

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