Research Article
Received: 01.08.2024
Accepted: 29.03.2025
Published: 10.04.2025

Journal of Disaster and Risk
8(1), 2025, (356-371)
e-ISSN: 2636-8390
DOI: 10.35341/afet.1526410

Metaphorical Perceptions of Secondary School Students Towards Earthquake: The Case of Türkiye, Italy, Romania, Poland and Crotia

Halil Ziya Özcan [1]

Abstract

In this research, it was aimed to determine the perceptions of students studying at secondary school level in different European countries towards the earthquake phenomenon. For this purpose, phenomenology design, one of the qualitative research methods, was adopted. In the research process, metaphor form was used as a data collection tool. The data were analysed descriptively and percentages and frequencies were tabulated and analysed. 126 secondary school students were involved in the research process. Based on the findings obtained in the research, it was concluded that the participant students have a fear-based perception of earthquake and see earthquake as an element of power. In addition, it was determined that most of the students did not have sufficient knowledge about earthquake, had uncertainty about how to act in case of a disaster and considered the effects of earthquake as an inevitable disaster. Based on the results, earthquake education should go beyond theoretical knowledge and be supported by practical exercises and simulations. Natural disaster education should be integrated into course contents and teachers should be equipped with in-service trainings on this subject. In addition, disaster awareness should be reinforced in the family environment by organising information seminars for parents.

Keywords: Earthquake, European Countries, Natural Disaster, Metaphor, Perception, Secondary School Students

1. INTRODUCTION AND CONCEPTUAL BACKGROUND

Natural disasters continue to exist as an inevitable reality in human life. These natural events, which are the natural consequences of natural processes on earth, can affect human life and cause large-scale damages. Such natural disasters as earthquakes, floods, volcanic eruptions and hurricanes can cause sudden and often unexpected catastrophes in areas where people live. These disasters can test the resilience of communities, create situations that require immediate response and often have long-term effects (Dilek & Kahya, 2023). The devastation and damages caused by natural disasters demonstrate humanity's vulnerability to the forces of nature and the importance of taking precautions against such events (Alexander, 2013; Cutter et al., 2003). Therefore, understanding, monitoring, and mitigating the risks of natural disasters is a priority agenda item for societies and political decision-makers (IPCC, 2014; Tierney, 2019). Earthquakes are one of the most important natural disasters for which precautions should be taken and societies should be educated about them. The World Health Organisation (2024) describes an earthquake as a violent and sudden earth tremor caused by the movement between tectonic plates along a fault line in the earth's crust. Nasa (2021) states that an earthquake is an intense shaking of Earth's surface and this shaking is caused by movements in the outermost layer of the Earth.

[1] Dr., Uşak İl Milli Eğitim Müdürlüğü, Milli Eğitim Bakanlığı, Uşak, Türkiye
e-mail: halilziyaozcan@gmail.com ORCID No: 0000-0003-3868-0972

To cite this article
Özcan, H. Z., (2025). Metaphorical Perceptions of Secondary School Students Towards Earthquake: The Case of Türkiye, Italy, Romania, Poland and Crotia. J*ournal of Disaster and Risk,* 8(1), 356-371.

The Disaster and Emergency Management Presidency (2019) defines earthquake as the event in which the energy resulting from the fracture of the earth's crust due to the effect of tectonic forces or volcano activities spreads in the form of seismic waves and shakes the environment and the earth strongly. Hence, it is possible to consider earthquakes as natural disasters that cause the earth's crust to move as a result of the sudden movement of the structures in the lower layers of the earth and sometimes cause serious damage.

Earthquake is a natural disaster that not only negatively affects the human body, mental and psychological health, but also causes sociological damage to the society living in. In addition, it disrupts economic stability by destroying infrastructure, businesses, and livelihoods, leads to environmental degradation such as soil liquefaction and landslides, and strains public services like healthcare and emergency response systems. Furthermore, earthquakes can result in the displacement of large populations, creating long-term housing crises and altering demographic structures in affected regions. As a result of natural disasters, children and teenagers as well as elders (Büyükşahin Çevik, 2023; Göktepe, 2014; Maclean, Popovici, & French, 2016; Sarman, 2012; Scott et al., 2014) are negatively affected.

One of the methods of learning individuals' perceptions and attitudes towards any concept is metaphors. For example, a study examining nursing students' metaphorical perceptions of professional communication and nursing concepts showed that metaphors are effective in understanding such perceptions (Yıldız İçigen & Sönmez, 2024). Similarly, another study investigating the metaphorical perceptions of secondary school students towards the concept of artificial intelligence revealed that metaphors are an important tool in revealing individuals' perceptions and attitudes towards certain concepts (Tartuk, 2023). Metaphor is used to express a situation, problem, case in another way. They are metaphors that serve to explain and simulate one thing with another thing. Through the art of metaphor, the message is given vitality, depth and a strong meaning. Since metaphors provide indirect expression, they ensure that the message is conveyed to the source without being personalised. Therefore, it breaks the resistance of consciousness and penetrates the subconscious (Metaphor Interactive Agency, 2024). Johnson et al. (2023), express that metaphorical language is used to transfer one concept as a representative or symbol of another concept and that the use of metaphor in figurative language is more than just a part of presenting poetic imagination. Wickman et al. (1999) state that it would be a limited viewpoint to ignore the cognitive dimension based on thought by considering the metaphors developed only as a figurative expression based on the use of language and words. Unlike the traditional approach that considers metaphors only as verbal expressions aiming at indirect explanation; contemporary approaches accept metaphors as an important and integrating part of the conceptual system (Lyddon et al. 2001). As stated by Karaırmak and Güloğlu (2012), in situations that words and expressions are inadequate, the meaning of the feelings and thoughts that belong to the emotions and thoughts of individuals' private life are transferred to the outside world via metaphor. Metaphor is the major system behind reasoning and the comprehension of intangible events.

There are various approaches and applications in the literature on how metaphors can be used in education. Chibaya (2019), for example, emphasises that metaphors can be used effectively in teaching programming concepts. In the study, it is stated that students' developing metaphors appropriate to their own contexts facilitates the understanding of technical terms and deepens the learning processes. It is stated that metaphors created by students constitute an important resource in the teaching process. The role of metaphors in education is not only limited to the explanation of concepts, but also shapes the way students think. In a study by Wlaszczyk and Indurkhya (2016), how metaphors can be used in the design of educational interfaces was discussed. In the research, it is stated that the conscious use of metaphors to explain complex concepts improves learning strategies and builds on students' prior knowledge and conceptual

representations. In this context, the potential of metaphors to help students understand new concepts is emphasised.

Moreover, in a study conducted on pre-service teachers' metaphors, important findings were obtained on how teacher education programmes are perceived. In the study conducted by Yayla and Demircioğlu (2014), the metaphors created by pre-service teachers by completing the statement 'Teacher education programmes are like ...' were examined. This study reveals how pre-service teachers perceive education programmes and the effects of these perceptions on educational processes. The 162 valid metaphors obtained were divided into five categories representing various aspects of education programmes.

The effect of metaphors in education is closely related to cognitive processes. In a study by Khatin-Zadeh and Khoshsima (2021), the effect of metaphors on comprehension processes was examined. The study concluded that metaphors facilitate the understanding of subsequent metaphors by activating a predetermined schema. This makes the role of metaphors in education even more important because they help to develop students' conceptual schemas. The use of metaphors in education also plays an important role in the design of instructional materials. A framework proposed by Moape et al. (2017) addresses the appropriate pedagogical use of metaphors in teaching computer programming concepts. This framework supports teaching processes by presenting a combination of theories such as conceptual metaphor theory and experiential learning.

Various studies (Arjun et al., 2023; Arslan et al., 2023; Avcı & Kayıran, 2023; Benzer & Arpalık, 2021; Birello & Pujola, 2023; Buckner-Capone, 2023; Çakaroğlu & Ömür, 2020; Çavuş & Balçın, 2020; Demir Yıldız & Demir Öztürk, 2023; Nguyen Giang, 2023; Hamdan et al., 2023; McMullen & Tay, 2023; Özkorkmaz, 2023; Soğancı & Gülboy, 2023; Şad & Aydın; 2023; Yakşi, 2023; Wilding et al., 2022) have been carried out aiming to find out the perception of any concept or subject and to conclude a phenomenon by analysing metaphors. In this study, a same method path was adopted and it was aimed to analyse the perceptions and attitudes of secondary school students towards the concept of earthquake as a disaster by analysing the metaphors they created. Considering this main objective, the following sub-questions have been attempted to be addressed:

- Which metaphors do secondary school students create to express their perceptions of earthquake?
- What is the thematic distribution of the metaphors developed by secondary school students towards earthquake?
- What is the distribution of the themes related to earthquake as a disaster on the gender of the secondary school students?
- What are the lexical associations of secondary school students regarding earthquake?

2. METHODOLOGY

2.1. Research Design

In this research, which aims to determine the perceptions of secondary school students towards earthquake as a disaster by analysing the metaphors they created, it is used phenomenological design, which is one of the qualitative research methods. Creswell (2014) defines phenomenological research as "a design of inquiry coming from philosophy and psychology in which the researcher describes the lived experiences of individuals about a phenomenon as described by the participants." Also, Lundh (2020) defines phenomenology as the scientific analysis of our personal experiences in the world.

2.2. Participants

This research aimed to involve secondary school students. For this aim, a consortium was formed by the participation of one school each from Turkey, Italy, Romania, Poland and Crotia. In each school included in the consortium, secondary school students were contacted and the main aims and process of the research were informed to them. Following this, it was emphasised that participation in the research was entirely voluntary and the students who wanted to participate were included in the research group. The convenience/suitability sampling method was effective in determining the research group on the basis of voluntary participation. Onwuegbuzie and Collins (2007), discuss convenience sampling as the selection and inclusion of groups that are suitable in terms of accessibility and convenience and who participate voluntarily in order to answer the main problem of the research. The participant information is shown in Table 1.

Table 1. The distribution of participants by country and gender

Gender/Country	Türkiye		Italy		Romania		Poland		Crotia		Total
	f	%	f	%	f	%	f	%	f	%	
Girl	14	58.3	19	61.3	15	60	12	57.1	9	36	**69**
Boy	10	41.7	12	38.7	10	40	9	42.9	16	64	**57**
Total	**24**	**100**	**31**	**100**	**25**	**100**	**21**	**100**	**25**	**100**	**126**

Table 1 presents the country and gender distribution of the secondary school students involved in the research. According to the table, 14 girls and 10 boys from Türkiye, 19 girls and 12 boys from Italy, 15 girls and 10 boys from Romania, 12 girls and 9 boys from Poland, 9 girls and 16 boys from Crotia participated in research. A total of 126 secondary school students participated in the research voluntarily. The researcher coded the participating students according to their countries and genders in the process of transferring the data, obtained during the research, to the computer. In the coding, Türkiye is expressed with the letter T, Italy with I, Romania with R, Poland with P and Crotia with C. Girls were coded with the letter G and boys were coded with B. These codings were created as follows: Girls from Türkiye (TG1, TG2, TG3, TG4...), boys (TB1, TB2, TB3, TB4...), girls from Italy (IG1, IG2, IG3, IG4...), boys (IB1, IB2, IB3, IB4...), girls from Crotia (CG1, CG2, CG3, CG4...), boys (CB1, CB2, CB3, CB4...), girls from Romania (RG1, RG2, RG3, RG4...), boys (RB1, RB2, RB3, RB4...), girls from Poland (PG1, PG2, PG3, PG4...), boys (PB1, PB2, PB3, PB4...). The coding procedure was done in order to facilitate the researcher in the data analysis process.

2.3. Data Collection Tools and Process

Considering the reviewed literature, there are some researches that targeted to identify the perceptions and attitudes towards specific concepts by analysing the metaphors created by the respondents. In these researches, the authors (Atik, 2020; Saylık et al., 2021; Yıldız & Algün Doğu, 2022; Aktepe et al., 2020; Doğan et al., 2021; Kahraman et al., 2023) were observed to present a worksheet for the concept that they aimed to identify the perceptions and attitudes of the participants during the data collection process, and it was found that they mostly asked the participants to fill in the statement "......is like .... Because ..." expression by expressing the metaphor and its reasoning. In this study, the same data collection method used in the studies mentioned above was used. The researcher included secondary school students from different European countries in order to provide a global perspective. At this point, the researcher contacted the teachers with whom had worked in Erasmus plus projects in the previous period and informed them about the research that wanted to conduct. After getting positive feedback, the researcher shared an online Google form that had prepared beforehand with the teachers in each country. In this step, the researcher emphasised to the teachers who would help for participation in the research was voluntary and asked them to have their volunteer students fill out the form. The language of the form was English and it was emphasised that metaphors and reasoning should

not be written in a different language. However, for the students who did not understand the language of the form, the sentences in the form were translated into their own language and the students were given the assistance they needed. In this Google form, two sentences were asked to be responded in by the participants. The first one is " An earthquake is like..... Because....." The second one is "What word or term does the 'Earthquake' remind you about? (Just one word or term)". The first sentence was used to analyse the perception towards the earthquake, and the second one was used to reveal the word or concept that the earthquake reminded the students. As a result of the data collection process, ……. secondary school students responded to the sentences in the Google form and thus formed the data set of the research. Following this step, the data collection process of the research was completed.

2.4. Data Analysis

The data analysis process was carried out in four steps. Before starting the data analysis process, the researcher reviewed the literature and examined the data analysis stages of the studies conducted to identify the perceptions of any concept. As a result of the review, it was found that similar stages were carried out in some studies (Arabacı & Ulutaş, 2023; Demir & Şahin, 2024; Kadan, 2023; Tekin Bozkurt, 2023). Firstly, the researcher transferred the metaphors written by the students participating in the study to an Excel file. Afterwards, it was proceeded to the classification stage, which is the first step of the analysis process. At this stage, the metaphors and reasonings were carefully analysed and it was examined whether they were meaningful or not.
In the second step, the metaphors were eliminated and refined. In this step, the researcher identified the responses with incompatibility between metaphor and reasoning or no reasoning and eliminated 3 metaphors and reasonings from the data analysis process. In any way, these data were not used in the evaluation. It was determined that there was a mismatch in the metaphors and reasonings created by the students with the code RG6, RB4 and TG6. The metaphors and reasonings that were not included in the evaluation are shown below:

- An ocean full of different fishes. Because none of them are making fun of each other (RG6).
- To me an earthquake is like light bulb. Because……. (RB4).
- An earthquake is like a building. Because millions of people die (TG6).

In the third stage of data analysis, the data obtained from the study group (metaphors and reasonings) were divided into themes. In the thematic classification of the metaphors, the focus was on the reasonings rather than the metaphors they created. Based on the common characteristics of the justifications, the metaphors were categorised into different themes. As a result of the thematic classification, 123 metaphors and reasonings were grouped under a total of 8 themes, and these ones are as follows:

- Earthquake as contrast: There is 1 metaphor in this category. This metaphor and reasoning are as follows: Earthquake is like a bomb for me because it is very funny. Here, bomb and funny are contrasted.

- Earthquake as difficulty: There is 1 metaphor in this category. This metaphor and reasoning are is follows: Earthquake to me is the biggest problem because There are a lot of problems behind it For example makes life difficult. This metaphor is included in the difficulty category because earthquake makes life difficult.

- Earthquake as extinction: There are 15 metaphors in this category. Some of these metaphors and their justifications are as follows: 'Earthquake is like the angel of death because it comes and you die.' 'It is like big disaster because it destroys many buildings and lives'. As can be understood from the 2 metaphors and their reasonings, the destructive characteristic of the earthquake was emphasised.

- Earthquake as fear: There are 34 metaphors in this category. Some of these metaphors and their reasonings are as follows: 'An earthquake is like a graveyard. Because you are in darkness during an earthquake.' 'To me, an earthquake is like really scary because i dont like it when it happens.' 'A tragedy, innnocent people are dying.' Looking at the metaphors and justifications, it is also understood that earthquake creates fear on individuals.

- Earthquake as human: There are 8 metaphors in this category. Some of these metaphors and their justifications are as follows: 'An earthquake is like a hitman. Because you never know where and when will come.' 'To me, an earthquake is like a thief because he steal's the house.' As can be understood from the metaphors and reasonings, the earthquake was metaphorically attributed to an individual.

- Earthquake as normality: There is 1 metaphor in this category. This metaphor and its reasoning is as follows: 'To me, an earthquake is like a normal thing in nature because it is normal to experience earthquake.' This justification shows the expressions of an individual who accepts earthquake as a normal situation.

- Earthquake as power: There are 59 metaphors in this category. Some of these metaphors and reasonings are as follows: 'To me, an earthquqake is like an angry dragon because it destroys everything around it.' 'Huge disaster, because it even can lead to the collapse of buildings.' 'Earthquake is like godzilla. Because you watch helplessly.' The overwhelming power of the earthquake is emphasised in the metaphors and justifications.

- Earthquake as uncertainty: There are 5 metaphors in this category. Some of these metaphors and justifications are as follows: 'To me, an earthquqake is something new, because i do not ever expierienced it.' 'To me, an earthquake is like an unknown feeling because I have never experienced such a thing.' Here, too, uncertainty comes to the fore.

In the final stage in the process of analysing the data, the researcher checked the reliability and acceptability of the obtained data. In this context, the researcher asked for the opinions of two experts in order to reveal the content validity of the thematic distribution formed as a result of the analysis of the metaphors and reasonings created by the secondary school students. Here, the researcher sent the alphabetically ordered list of metaphors and reasonings to the experts via e-mail. The experts were asked to examine the thematic distribution and to note the metaphors that they disagreed with the researcher thematically. In addition, in order to eliminate the incompatibility between metaphor and theme, it was emphasised that the experts should indicate under which theme the metaphor they disagreed with should be. After the feedback from the experts, the thematic distribution put forward by the researcher and the experts was analysed. At this step, the metaphors and themes with agreement and disagreement were determined. It was observed that there was a difference of disagreement between the evaluations of the experts and the researcher's evaluations in the distribution of 4 metaphors-themes (Roller coaster, Carousel, Accident, Evilness). Based on the reviewed literature, it is concluded that the researchers who study metaphorical research (Ayvacı et al., 2021; Gürel, 2021; Şakar & Köksal, 2021;) refer to expert opinion in order to provide validity and reliability for their research and reach a conclusion by using the formula (Reliability = Consensus / Consensus + Disagreement × 100) put forward by Miles and Huberman (1994) based on the number of consensus and disagreement. The researcher used a similar method to check the reliability of the research. According to the analysis, it was analysed that the reliability of the research was (119 / (119 +4) × 100 = 96%). Miles and Huberman (1994), states that the reliability of the research is ensured if the consensus between the researcher and experts is above 90% depending on the size and range of the coding scheme. Based on this expression, it can be stated that this research also provides reliability with 96%.

2.5. Ethical Approval of The Research

In this research, all the rules specified in the "Directive on Scientific Research and Publication Ethics of Higher Education Institutions" were complied with. None of the actions specified under the second section of the Directive, "Actions Contrary to Scientific Research and Publication Ethics", have been carried out.

Permission was obtained with the approval of the Ethics Committee of Uşak University numbered E-89784354-050.99-204001 and dated 04.04.2024.

3. FINDINGS

In this part, the analyses based on 77 different, totaly 123 metaphors created about earthquake as a disaster are presented in tabular form according to the theme and gender of the participants. The findings related to each sub-problem are shared and interpreted under separate headings.

3.1. Findings and Comments Related to The First Sub-Problem

As the first sub-problem within the scope of the research, it was aimed to find an answer to the question "Which metaphors do secondary school students create to express their perceptions of earthquake?". The findings obtained as a result of the analyses are shown in Table 2.

Table 2. Metaphors created by secondary school students about earthquake

Rank	Metaphors	f	%	Rank	Metaphors	f	%
1	Disaster	11	8.9	45	Human	1	0.8
2	Misfortune	5	4.1	46	Hurricane	1	0.8
3	Shaker	5	4.1	47	Jaws	1	0.8
4	Bomb	4	3.2	48	Jolt	1	0.8
5	Nightmare	4	3.2	49	Killer	1	0.8
6	Scary movie	4	3.2	50	Landslide	1	0.8
7	Tsunami	4	3.2	51	Large Mass of Water	1	0.8
8	Sea	3	2.4	52	Loud Speaker	1	0.8
9	Tragedy	3	2.4	53	Meteorite Impact	1	0.8
10	Turbolence	3	2.4	54	Moment of Death	1	0.8
11	Carousel	2	1.6	55	Monster	1	0.8
12	Giant	2	1.6	56	Movie	1	0.8
13	Graveyard	2	1.6	57	Naturel Phenomenon	1	0.8
14	Horror Movie	2	1.6	58	New Thing	1	0.8
15	Huge wave	2	1.6	59	Normality	1	0.8
16	Swing	2	1.6	60	Nothing	1	0.8
17	War	2	1.6	61	Nuclear Bomb	1	0.8
18	Wind	2	1.6	62	Ocean	1	0.8
19	Winter Day	2	1.6	63	Ogre	1	0.8
20	Accident	1	0.8	64	Panic	1	0.8
21	Angel of Death	1	0.8	65	Roller Coaster	1	0.8
22	Angry Dragon	1	0.8	66	Ship	1	0.8
23	Assassin	1	0.8	67	Shock	1	0.8
24	Boxer	1	0.8	68	Storm	1	0.8
25	Cataclysm	1	0.8	69	Thanos	1	0.8
26	Collapse	1	0.8	70	Thief	1	0.8
27	Construction Machine	1	0.8	71	Thor's Hammer	1	0.8
28	Core of Earth	1	0.8	72	Thunder	1	0.8
29	Cradle	1	0.8	73	Titan	1	0.8
30	Crash	1	0.8	74	Torture	1	0.8
31	Crocodile	1	0.8	75	Tree	1	0.8
32	Danger	1	0.8	76	Tremors	1	0.8
33	Death	1	0.8	77	Unknown Feeling	1	0.8
34	Destruction	1	0.8		**Total**	**123**	**100**

35	Dooms day	1	0.8
36	Driving on Rocky	1	0.8
37	Earth Crust	1	0.8
38	End of the World	1	0.8
39	Evilness	1	0.8
40	Fallen Tree	1	0.8
41	Godzilla	1	0.8
42	Hand of God	1	0.8
43	Hitman	1	0.8
44	Hulk	1	0.8

Table 2 shows the metaphors developed by the participants in the research on earthquake and frequency of these metaphors. Analysing the data obtained, it is seen that 77 different metaphors were created by 123 participants. Based on the frequency of the metaphors on earthquake, 'Disaster' with a frequency of 11, 'Misfortune' and 'Shaker' with a frequency of 5, 'Bomb', 'Nightmare', 'Scary Movie' and 'Tsunami' with a frequency of 4.

3.2. Findings and Comments Related to The Second Sub-Problem

As the second sub-problem within the scope of the research, it was aimed to find an answer to the question "What is the thematic distribution of the metaphors developed by secondary school students towards earthquake?". The findings obtained as a result of the analyses are shown in Table 3.

Thematic distribution as a result of the analysis of the metaphors and reasonings gathered during the research process is illustrated in Table 3. Following the thematic distribution, 8 different themes were formed. Analyses revealed that metaphors were mostly grouped in the theme of 'Power' (f: 59). This is followed by the theme of 'Fear'. This theme includes a total of 34 metaphors.

Table 3. Distribution of metaphors developed about earthquake based on themes

Themes	Metaphor (Frequency)	Number of Different Metaphors	Total Metaphor Frequency
Earthquake as Contrast	Bomb (1)	1	1
Earthquake as Difficulty	Misfortune (1)	1	1
Earthquake as Extinction	Angel of Death (1), Death (1), Destruction (1), Disaster (2), Doomsday (1), End of the World (1), Evilness (1), Graveyard (1), Jaws (1), Misfortune (3), Nuclear Bomb (1), War (1)	12	15
Earthquake as Fear	Accident (1), Carousel (1), Cataclysm (1), Crocodile (1), Danger (1), Disaster (6), Graveyard (1), Horror Movie (2), Meteorite Impact (1), Misfortune (1), Moment of Death (1), Naturel Phenomenon (1), Nightmare (4), Panic (1), Scary Movie (4), Torture (1), Tragedy (3), War (1), Winter Day (2)	19	34
Earthquake as Human	Assassin (1), Boxer (1), Hitman (1), Hulk (1), Human (1), Killer (1), Thanos (1), Thief (1)	8	8
Earthquake as Normality	Normality (1)	1	1

Earthquake as Power	Angry Dragon (1), Bomb (3), Carousel (1), Collapse (1), Construction Machine (1), Core of Earth (1), Cradle (1), Crash (1), Disaster (3), Driving on Rocky (1), Earth Crust (1), Fallen Tree (1), Giant (2), Godzilla (1), Hand of God (1), Huge Wave (2), Hurricane (1), Jolt (1), Landslide (1), Large Mass of Water (1), Loud Speaker (1), Monster (1), Ocean (1), Ogre (1), Riding bike on Rocky (1), Roller Coaster (1), Sea (3), Shaker (5), Ship (1), Shock (1), Storm (1), Swing (2), Thor's Hammer (1), Thunder (1), Titan (1), Tree (1), Tremors (1), Tsunami (4), Turbolence (3), Wind (2)	40	59
Earthquake as Uncertainty	Movie (1), New Thing (1), Nothing (1), Unknown Feeling (1)	4	4
Total		**86**	**123**

3.3. Findings and Comments Related to The Third Sub-Problem

As the third sub-problem within the scope of the research, it was aimed to find an answer to the question " What is the distribution of the themes related to earthquake as a disaster on the gender of the participants?". The findings obtained as a result of the analyses are shown in Table 4.

Table 4. Distribution of themes related to earthquake according to participant gender

Themes	**f**	**Girls**		**Boys**	
		f	**%**	**f**	**%**
Earthquake as Contrast	1	0	0	1	1.7
Earthquake as Difficulty	1	1	1.5	0	0
Earthquake as Extinction	15	6	8.9	9	16.2
Earthquake as Fear	34	19	28.5	15	26.8
Earthquake as Human	8	4	5.9	4	7.2
Earthquake as Normality	1	1	1.5	0	0
Earthquake as Power	59	33	49.2	26	46.4
Earthquake as Uncertainty	4	3	4.5	1	1.7
Total	**123**	**67**	**100**	**56**	**100**

Table 4 shows the gender-based distribution of the thematic classification of the metaphors developed by the participants involved in the research process. The numerical values in the table indicate under which theme the metaphors are grouped in the genders. Considering the number of metaphors developed, girls (f: 67) created more items than boys (f: 56). Taking into account the thematic distribution according to the gender of the participants, the metaphors that both boys (f: 33) and girls (f: 26) created are grouped in the theme of "Earthquake as Power" (f: 59). Then, "Earthquake as Fear" (f: 34) and "Earthquake as Extinction" (f: 15) follow this theme with the highest number of items.

3.4. Findings and Comments Related to The Third Sub-Problem

As the fourth sub-problem within the scope of the research, it was aimed to find an answer to the question "What are the lexical associations of secondary school students on earthquake?". The findings obtained as a result of the analyses are shown in Figure 1.

Figure 1 illustrates the lexical connections forming in the minds of the participant students about earthquake. In analysing word associations, it is aimed to see whether there is a connection with metaphors. Analysing the word cluster, it is clear that the metaphors created and the lexical items in their mental schemata are close to each other. Even colouring in the word cluster has no

meaning, the size of the items refers to the number of occurrences. So, we can deduce that the words such as 'Destruction', 'Disaster', 'Dead', 'Darkness', 'Fear', 'Shaking' are more dominant in the minds of the participants.

Figure 1. The lexical cloud of association of teenagers related to earthquake

4. CONCLUSION AND RECOMMENDATIONS

In the current research, I aimed to reveal the mental and psychological reflections of earthquake, one of the natural disasters, in the minds of secondary school students. Towards this end, data were collected from secondary school students in 5 different countries in the Europe. The students were asked to express how they perceived the earthquake in one word with the reasoning.

Based on these findings, it can be inferred that students predominantly perceive earthquakes as destructive and fear-inducing phenomena. The frequent use of metaphors such as "Disaster (f: 11)" "Misfortune (f: 5)" and "Bomb (f: 4)" indicates that students associate earthquakes with sudden, uncontrollable, and catastrophic events. Considering the literature, there are some studies that get similar results. Doğan et al. (2021) examined the metaphors of secondary school students about earthquake in their research. As a result of the analyses, it was seen that 'disaster' and 'fear' metaphors were among the most frequently used metaphors. In also Çelik and Gündoğdu (2022), it was determined that 'Disaster' was the most frequently created metaphor among the metaphors developed for earthquake. Atila (2024) also obtained a similar result. In his research, it was understood that secondary school students expressed the earthquake in the 'Disaster' metaphor the most. Türker et al. (2024) aimed to determine the perceptions of secondary school students who experienced the 6 February earthquake towards earthquake through metaphors, and it was seen that a significant portion of the participants accepted the earthquake as 'Disaster'. This perception is further reinforced by the thematic distribution, where earthquakes are most commonly viewed as elements of power and fear.

The strong emphasis on power suggests that students recognize the immense and uncontrollable force of earthquakes, seeing them as dominant natural events beyond human intervention. Meanwhile, the metaphors categorized under fear highlight the emotional response that earthquakes evoke, aligning with their unpredictable and devastating nature.
Given that all the identified metaphors carry negative connotations, it is evident that students lack positive or neutral associations with earthquakes. This could be due to media portrayals, past

traumatic experiences, or a general lack of education on earthquake preparedness. If students were more frequently exposed to narratives that emphasize resilience, preparedness, and scientific understanding of earthquakes, their perceptions might become more balanced, potentially incorporating themes of adaptation and learning alongside fear and destruction.
These findings suggest that educational initiatives focusing on disaster awareness should not only provide factual information about earthquakes but also address students' emotional responses. By incorporating psychological preparedness and fostering a sense of control through knowledge and preparedness training, it may be possible to shift students' perceptions from helplessness toward empowerment.

This result is considered understandable, as earthquakes are commonly associated with destruction and loss, both in real-life experiences and through media representations. The prevalence of words such as "Destruction," "Disaster," "Dead," and "Fear" highlights the deep psychological impact and the immediate sense of danger that earthquakes evoke in young individuals. The presence of terms like "Darkness," "Shaking," and "Confusion" further suggests that participants associate earthquakes not only with physical devastation but also with feelings of uncertainty and chaos.

Given this strong negative perception, it is crucial to implement educational programs that not only provide factual knowledge about earthquakes but also address students' emotional responses. Raising awareness about preparedness strategies, survival techniques, and the science behind earthquakes can help transform fear into a sense of control and readiness. By fostering a culture of preparedness and resilience, students can shift their focus from the destructive aspects of earthquakes to the importance of safety measures and disaster management. Over time, this approach may help reduce fear-driven perceptions and replace them with a more balanced understanding that emphasizes both the risks and the ways to mitigate them.

Based on the findings, it is clear that students' perceptions of earthquakes are largely shaped by negative associations related to destruction and fear. To address these concerns and foster a more balanced understanding, the following recommendations are proposed:

- **Incorporate Earthquake Education into the Curriculum:** Schools should integrate comprehensive earthquake education programs into their curriculum, focusing not only on the scientific aspects of earthquakes but also on practical preparedness strategies. By teaching students about the causes of earthquakes, the importance of building safety, and how to respond in case of an earthquake, they can gain a sense of control over the situation. This approach will help demystify the event and shift perceptions from fear to preparedness.

- **Use Positive and Resilient Narratives:** In addition to addressing the physical and emotional impacts of earthquakes, educational materials should include stories of resilience, survival, and recovery. Highlighting the efforts of communities and individuals who have successfully rebuilt after earthquakes can provide students with a more hopeful outlook. These stories should emphasize the importance of disaster preparedness and community support, which can empower students rather than leaving them feeling helpless.

- **Engage in Psychological Preparedness:** Emotional preparedness is just as important as physical preparedness. Schools should implement programs that help students cope with the fear and anxiety that often accompany thoughts of earthquakes. This could include workshops on stress management, mindfulness practices, and creating a personal disaster plan. Addressing students' emotional responses through such interventions can reduce

anxiety and help them feel more confident and capable in the face of potential earthquakes.

- **Promote Simulation and Hands-on Activities:** Schools should organize earthquake simulation drills and hands-on activities that allow students to experience and practice earthquake response strategies in a safe and controlled environment. These activities can teach students how to react in the event of an earthquake, and practicing these responses will not only improve their preparedness but also help reduce fear by providing a sense of control. Additionally, involving students in community-wide disaster preparedness events can increase their engagement and sense of responsibility.

- **Involve Families and Communities:** Disaster preparedness should extend beyond the school setting. Schools should collaborate with local authorities and communities to offer workshops for parents and families on earthquake preparedness. By involving the whole family, students will be able to reinforce the lessons they learn in school and ensure that earthquake readiness becomes a shared responsibility. Furthermore, creating family emergency plans and safety protocols can help alleviate the fear of the unknown.

- **Continuous Assessment and Feedback:** It is essential to continuously assess the effectiveness of earthquake education programs and make adjustments based on students' evolving needs. Surveys and feedback from students, teachers, and parents can provide valuable insights into the emotional and psychological impact of the programs. This ongoing evaluation will ensure that educational initiatives remain relevant and effective in reducing fear and enhancing preparedness.

In conclusion, by adopting a holistic approach that addresses both the intellectual and emotional aspects of earthquake preparedness, it is possible to shift students' perceptions from fear and helplessness to a more informed, empowered, and resilient mindset.

REFERENCES

Alexander, D. (2013). Natural disasters. Routledge.

Akula. R. A., Driscoll, B., Narayana, P., Changpinyo, S., Jia, Z., Damle, S., Pruthi, G., Basu, S., Guibas, L., Freeman, W.T., Li, Y. & Jampani, V. (2023). MetaCLUE: Towards comprehensive visual metaphors research (pp. 23201-23211) Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR).

Aktepe, V., Uzunöz, A. & Sarıçam, İ. (2020). Ortaokul öğrencilerinin sosyal bilgiler dersinde çalışkanlık değerine yönelik metafor algıları. Ahi Evran Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 6(2), 449-466.https://doi.org/10.31592/aeusbed.660037

Arabacı, M. & Ulutaş, İ. (2023). Okul öncesi öğretmen adaylarının montessori yaklaşımına yönelik algıları: Bir metafor analizi. Uluslararası Bilim Ve Eğitim Dergisi, 6(3), 141-165.https://doi.org/10.47477/ubed.1314679

Arslan, K., Arı, A. G., & Kanat, M. H. (2023). Ortaokul öğrencilerine yönelik deprem okuryazarlığı ölçeği geliştirme çalışması. Türk Coğrafya Dergisi, (83), 163-178.

Avcı, A., & Kayıran, D. (2023). Türk öğrencilerin sığınmacı kavramına yönelik algılarının metaforlar yoluyla incelenmesi. Bayburt Eğitim Fakültesi Dergisi, 18(37), 116-139.https://doi.org/10.35675/befdergi.1199700

Ayvacı, H. Ş., Bülbül, S. & Bebek, G. (2021). Okul öncesi dönem çocuklarının çevre sorunları kavramına yönelik metaforik algıları ve görüşleri. Manisa Celal Bayar Üniversitesi Eğitim Fakültesi Dergisi, 9(1), 117-132.https://doi.org/10.52826/mcbuefd.922632

Atila, E. (2024). Asrın felaketini yaşayan ortaokul öğrencilerinin deprem farkındalıklarının ve metaforlarının bu felaketi yaşamayan öğrencilerle karşılaştırılması (Yayımlanmamış Yüksek Lisans Tezi). Eğitim Bilimleri Enstitüsü, Niğde Ömer Halisdemir Üniversitesi, Niğde.

Atik, A. D. (2020). Fen bilimleri öğretmen adaylarının uzaktan eğitim algısı: Bir metafor analizi. International Journal of Scholars in Education, 3(2), 148-170.

Benzer, S., & Arpalık, A. (2021). Farklı Deprem Bölgesinde Yaşayan Ortaokul Öğrencilerinin Deprem Konusundaki Bilgi Düzeyleri (The Knowledge Levels of Secondary School Students in Different Earthquake Regions about Earthquake). Journal of Anatolian Cultural Research (JANCR), 5(2), 107-119.

Birello, M. & Pujola, J. T. (2023). Visual metaphors and metonymies in pre-service teachers' reflections: Beliefs and experiences in the learning and teaching of writing. Teaching and Teacher Education, 122.https://doi.org/10.1016/j.tate.2022.103971

Buckner-Capone A. (2023). Why I climb mountains with students: Using metaphor as a teaching tool. Pedagogy in Health Promotion, 9(4):252-257.https://doi.org/10.1177/23733799231179234

Büyükşahin Çevik, G. (2023). Afetlerde eğitim ve yönetimi. S, Girgin (Ed.), Afet (travma) psikolojisi (s. 7-28). Efe Akademi Yayınları

Cambridge Dictionary (2024). Earthquake. Retrieved from https://dictionary.cambridge.org/dictionary/english/earthquake (Access date: 8 May 2024)

Chibaya, C. (2019). A Metaphor-Based Approach for Introducing Programming Concepts. International Multidisciplinary Information Technology and Engineering Conference (IMITEC), Vanderbijlpark, South Africa, 1-8,

Creswell, J. W. (2014). Research Design: Qualitative, Quantitative and Mixed Methods Approaches (4th ed.). London: Sage Publications Ltd.

Cutter, S. L., Boruff, B. J., & Shirley, W. L. (2003). Social vulnerability to environmental hazards. Social Science Quarterly, 84(2), 242-261.

Çakaroğlu, D. & Ömür, E. H. (2020). "Oyun" kavramına ilişkin algının metafor yoluyla belirlenmesi. Sinop Üniversitesi Sosyal Bilimler Dergisi, 4 (1), 155-164.https://doi.org/10.30561/sinopusd.735857

Çavuş, R., & Balçın, M. D. (2020). Deprem eğitim merkezi gezisinin ortaokul öğrencilerinin depreme yönelik tutumlarına etkisinin incelenmesi. Gaziantep Üniversitesi Eğitim Bilimleri Dergisi, 4(2), 55-72.

Demir Yıldız, C. & Demir Öztürk, E. (2023). Üniversite öğrencilerinin depreme ilişkin metaforik algıları. Üniversite Araştırmaları Dergisi, 6(3), 308-316.https://doi.org/10.32329/uad.1313899

Demir, F. B. & Şahin, A. (2024). Sosyal bilgiler öğretmen adaylarının enflasyon kavramına ilişkin algılarının metafor yoluyla incelenmesi. Ahi Evran Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 10(1), 1-19.https://doi.org/10.31592/aeusbed.1304337

Dilek, Y. & Kahya, Ö. (2023). Flood and Earthquake as Punishment of Gods in Antiquity. Journal of Disaster and Risk, 6(3), 819-828.

Doğan, M., Nacaroğlu, O. & Ablak, S. (2021). Sivrice depremini yaşamış ortaokul öğrencilerinin depreme ilişkin metaforik algılarının incelenmesi: Malatya ili örneği. Dokuz Eylül Üniversitesi Buca Eğitim Fakültesi Dergisi, (51), 384-402. https://doi.org/10.53444/deubefd.885116

Johnson, M. I., Hudson, M. & Ryan C. G. (2023). Perspectives on the insidious nature of pain metaphor: We literally need to change our metaphors. Frontiers in Pain Research, 4, 1-13. https://doi.org/10.3389/fpain.2023.1224139

Göktepe, K. (2014). Çocukluk çağı travma sonrası duygusal stres ölçeğinin uyarlama, geçerlik ve güvenirlik çalışması [Yayımlanmamış Yüksek Lisans Tezi]. Üsküdar Üniversitesi Sosyal Bilimler Enstitüsü.

Gündoğdu, K. (2022). İlkokul, ortaokul ve lise son sınıf öğrencilerinin gözünden metaforlarla 'Deprem'. Rumeli Eğitim Araştırmaları Dergisi, (3), 36-59.

Gürel, D. (2021). Sosyal bilgiler öğretmen adaylarına göre 'siyasi iktidar': Bir metafor çalışması. İnsan ve Toplum Bilimleri Araştırmaları Dergisi, 10(4), 3475-3495.https://doi.org/10.15869/itobiad.960652

Hamdan, H. J., Al-Madanat, H. & Hamdan , W. (2023). Connotations of animal metaphors in the Jordanian context. Psycholinguistics, 33(1), 132-166.https://doi.org/10.31470/2309-1797-2023-33-1-132-166

IPCC (2014). Climate Change 2014: Impacts, Adaptation, and Vulnerability. Cambridge University Press.

Kadan, Ö. F. (2023). Öğretmenlerin yazma kavramına yönelik algıları: Bir metafor analizi. EKEV Akademi Dergisi(Özel Sayı), 282-300.https://doi.org/10.17753/sosekev.1343919

Khatin-Zadeh, O. & Khoshsima, H. (2021). Homo-schematic Metaphors: A Study of Metaphor Comprehension in Three Different Priming Conditions. J Psycholinguist, 50, 923–948.

Karaırmak, Ö. & Güloğlu, B. (2012). Metafor: Danışan ve psikolojik danışman arasındaki köprü. Turkish Psychological Counseling and Guidance Journal, 4(37), 122-135.

Kahraman, B. S., Demirhan, F. & Erdoğan, T. E. (2023). A metaphor study on the perception of the earthquake, the location and the future of the teachers who experienced the 6 february Kahramanmaraş earthquake. International Journal of Trends and Developments in Education, 3(2), 15–39.

Lundh, L. G. (2012). Non-directivity as a therapeutic stance, and dimension of therapeutic relating. Person-Centered & Experiential Psychotherapies, 11(3), 225–239.https://doi.org/10.1080/14779757.2012.700284

Lyddon, W. J., Clay, A. L. & Sparks, C. L. (2001). Metaphor and change in counseling. Journal of Counseling and Development, 79, 269-274.https://doi.org/10.1002/j.1556-6676.2001.tb01971.x

Maclean, J.C., Popovici, I. & French, M.T. (2016). Are natural disasters in early childhood associated with health and substance use disorders as an adult?. Social Science & Medicine, 151, 78-91.https://doi.org/10.1016/j.socscimed.2016.01.006

McMullen, L. M. & Tay, D. (2023). Research review of psychotherapists' use of metaphors. Psychotherapy, 60(3), 255–265.https://doi.org/10.1037/pst0000473

Metafor Interactive Agency (2024). Metafor nedir? https://www.metafor.com/metafor-nedir/(Access date: 20 May 2024)

Moape, T. G., Ojo, S. O. & Van Wyk, E. A. (2017). A framework for appropriate pedagogical use of conceptual metaphor in computing. 2017 International Conference on Computing Networking and Informatics (ICCNI), 1-9.

Nasa Science (2021, July 27). What Is an Earthquake? https://spaceplace.nasa.gov/earthquakes/en/ (Access date: 10 June 2024)

Ngunyen Giang, D. (2023). Vietnamese concepts of love through ıdioms: A conceptual metaphor approach. Theory and Practice in Language Studies, 13, 4, 855-866.https://doi.org/10.17507/tpls.1304.06

Onwuegbuzie, A. J. & Collins, K. M. T. (2007). A typology of mixed methods sampling designs in social science research. The Qualitative Report, 12(2), 281-316.https://doi.org/10.46743/2160-3715/2007.1638

Özkorkmaz, H., Türk, M. M., Taşyürek, K., Taşyürek, M., Baran, S., & Güler, T. (2023). 7. Sınıf Öğrencilerinin Deprem Hakkındaki Farkındalıklarının İncelenmesi. International Journal of Social and Humanities Sciences Research (JSHSR), 10(96), 1346-1362.

Sarman, A. (2012). Elazığ ili Karakoçan ilçesinde yaşanan yıkıcı deprem sonrasında, depremi yaşayan ilköğretim çağı çocuklarda kaygı düzeyi, depresyon belirtileri ve etkileyen faktörler [Yayımlanmamış Yüksek Lisans Tezi]. Fırat Üniversitesi Sağlık Bilimleri Enstitüsü.

Saylık, A., Saylık, N. & Sağlam, A. (2021). Eğitimcilerin gözünden türk eğitim sistemi: Bir metafor çalışması. Van Yüzüncü Yıl Üniversitesi Eğitim Fakültesi Dergisi, 18(1), 522-546.https://doi.org/10.33711/yyuefd.919424

Scott, B. G., Sanders, A. F. P., Graham, R. A., Banks, D. M., Russell, J. D., Berman, S. L. & Weems, C. F. (2014). Identity distress among youth exposed to natural disasters: Associations with level of exposure, posttraumatic stress, and internalizing problems. Identity: An International Journal of Theory and Research, 14(4), 255–267.https://doi.org/10.1080/15283488.2014.944697

Soğancı, S. & Gülboy, E. (2023). Ebeveynlerin gözünden özgül öğrenme güçlüğü: Bir metafor analizi. Ahi Evran Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 9(1), 255-274.https://doi.org/10.31592/aeusbed.1212387

Şad, S. N. & Aydın, Y. Ş. (2023). Ortaokul 8. sınıf öğrencilerinin "yeni nesil soru" kavramına ilişkin algılarının metafor yoluyla incelenmesi. İnönü Üniversitesi Eğitim Fakültesi Dergisi, 24(1), 378-399.https://doi.org/10.17679/inuefd.1227962

Şarkar, S. & Köksal, M. S. (2021). Özel eğitim öğretmen adaylarının iki kere farklılığa yönelik metaforik algıları. İnönü University Journal of the Faculty of Education, 22(3), 1924-1941.https://doi.org/10.17679/inuefd.908319

Tartuk, M. (2023). Metaphorical perceptions of middle school students regarding theconcept of artificial intelligence. International Journal of Education and LiteracyStudies, 11(2), 108-11.

Tekin Bozkurt, A. (2023). Öğretmen adaylarının değer kavramına ilişkin metafor algılarının incelenmesi. Fırat Üniversitesi Sosyal Bilimler Dergisi, 33(3), 1131-1141.https://doi.org/10.18069/firatsbed.1308498

The Disaster and Emergency Management Presidency (2019, August, 25). What Is an Earthquake?https://www.afad.gov.tr/deprem-nedir (Access date: 27 June 2024)

Tierney, K. (2019). Disasters: A sociological approach. Polity Press.

Türker, A., Çetin, T., & Erarslan, F. (2024). The perceptıons of secondary school students who experıenced the 6 february 2023 kahramanmaraş earthquake about earthquake: A qualitatıve research. SSD Journal, 9(46), 25–38.

Yakşi, A (2023). Ortaöğretim öğretmenlerindeki öğrenci algısının metaforik incelenmesi. International Social Sciences Studies Journal, 113, 7653-7660.https://doi.org/10.29228/sssj.70986

Yayla, G. & Demircioğlu, H. (2014). Examınatıon of teacher candıdates' metaphors related to teacher educatıon programs. The Eurasia Proceedings of Educational & Social Sciences (EPESS), 1, 292-297.

Yıldız, A. B. & Algün Doğu, G. (2022). Sporda teknoloji kullanımı: Bir metafor çalışması. Ahi Evran Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 8(1), 67-80.https://doi.org/10.31592/aeusbed.980957

Yıldız İçigen, A., Sönmez, S. Nursing students' metaphorical perceptions of professional communication and the concept of nursing in their first clinical practice: qualitative research. BMC Nursing, 23(952), 1-10.

Wickman, S.A., Daniels, M.H., White, L.J. & Fesmire, S.A. (1999). A 'primer' in conceptual metaphor for counselors. Journal of Counseling and Development, 77, 389-394.https://doi.org/10.1002/j.1556-6676.1999.tb02464.x

Wilding, E., Bartl, S., Littlemore, J., Clark, M. & Brooke, J. (2023) A metaphor analysis of older adults' lived experience of household isolation during COVID-19. Frontiers in Communication, 7, 1-13.https://doi.org/10.3389/fcomm.2022.1015562

Wlaszczyk, A. & Indurkhya, B. (2016). "On the use of metaphors in designing educational interfaces. 7th IEEE International Conference on Cognitive Infocommunications (CogInfoCom), Wroclaw, Poland, pp. 343-346.

World Health Organization (2024). Earthquakes. https://www.who.int/health-topics/earthquakes#tab=tab_1 (Access date: 1 July 2024)