

Article

“Emergency Decisions”: The Choice of a Simulated Emergency Scenario to Reproduce a Decision-Making Condition in an Emergency Context as Close to Reality as Possible

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Abstract: Decisions are a crucial aspect of human life, especially when made in emergency contexts. This research involved 348 subjects, evaluating the relationship between socio-demographic variables and the choice of one of the proposed emergency scenarios suitable for reproducing a decision-making condition in an emergency. Three scenarios were presented: one on climate change, one on pandemics, and one on seismic events. The survey captured individuals' perceptions of the scenarios for dimensions such as realism (present, past, and future), emotions, risk, worry, emergency, catastrophe, immediate choice, and immediate decision. The results suggest that age, gender, education, and previous experience are predictive factors for subjects' preferences regarding the chosen scenario and their evaluation of the related dimensions. To optimize decisions in emergencies by institutional decision makers and crisis managers, it is useful to expand knowledge and have data relevant to this area. This research provides a basis in terms of data and tools for designing future research and studies on decision making in emergency contexts.

Keywords: emergency decision making; emergency management; crisis response strategies; disaster preparedness strategies; emergency response tactics; catastrophe mitigation strategies; crisis management; decision psychology; cognition; safety



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1. Introduction

Decisions play a central role in every aspect of human life, both on an individual level and in the dynamics of complex organizations. The ability to make considered and rational decisions has a direct impact on one's success in the personal, professional, and social spheres. Through a complex series of processes, individuals, groups, and organizations make decisions on a daily and continuous basis. These decisions may concern mundane aspects of our lives, but they can also be complex decisions [1]. The quality of these decisions can vary greatly, depending on the available information and the method adopted. There are various human mental processes that lead to a decision, ranging from intuition to detailed analysis of data and information, passing through prior experience and rationality. Each approach has its strengths and weaknesses. However, the choice of the most appropriate approach depends on the nature of the decision to be made and the context in which it is made [2]. In an increasingly intricate and interconnected world, the ability to make decisions is a critically important skill in both controlled risk situations and emergencies [3–5]. Many previous studies have revealed that in conditions of uncertainty and risk, decision makers tend to operate with bounded rationality [6–9]. An emergency represents an unforeseen situation of real danger that occurs when individuals, property, structures, or the environment are exposed and could further be exposed to the harmful effects generated by an adverse event. These events often cause significant damage, both physical and material, to individuals or property and require response actions beyond ordinary procedures [3,4,10–12]. Risk, on the other hand, is linked to the concepts of uncertainty and probability regarding the occurrence of events which could cause harm to things and

people [13–15]. Instead, a crisis occurs when a community of people perceives an urgent threat to fundamental values or life-sustaining functions, which must be addressed under conditions of uncertainty. A crisis can therefore arise from a wide variety of threats [16,17]. A disaster, on the other hand, is defined in the literature as an episode that is collectively interpreted as highly damaging [18]. The destructive causes can be varied, but in most cases, they are attributed to natural causes as well as anthropogenic ones [19]. In recent decades, theorists of public policy and emergency management have increasingly recognized that the dynamic and complex environment of rapidly evolving emergency events requires a different approach from traditional hierarchical administration [20]. Emergency management involves a series of measures and interventions aimed at providing relief and assistance to communities affected by a disaster. Such interventions involve urgent actions and the activation of simplified procedures to expedite necessary assistance. What is needed is a theoretical foundation for the application of problem-solving assessments in educational contexts and a careful selection of tools to adequately measure this skill [21]. Informing the affected population promptly and accurately to ensure safety and awareness is of crucial importance. Emergency management requires a rapid, coordinated, and effective response to protect lives, reduce damage, and restore normalcy in communities affected by catastrophic events [22,23]. Decision making in emergency situations is a critical component of crisis management and preservation of the safety of people and resources. In these situations, time is often limited, information may be incomplete or uncertain, and decisions must be made quickly [4,24]. Problem solving and decision making in emergencies are closely linked to knowledge and therefore being prepared in the face of an adverse event [21], but being prepared and skilled sometimes is not enough to handle sudden crises excellently. The computational limits of human cognition must be considered [25,26].

The time pressure and speed of information processing must not compromise the quality and thoughtfulness of the decision-making process. At the heart of decision making in emergency situations is communication. Communication, and especially effective communication between all the actors involved, is also crucial to ensure that decisions are shared, understood, and correctly transposed by all [3–5,11,12,24], all the more so if they are taken as a group, thus also requiring taking into account the specific opinions and expertise of each individual [27] and avoiding the possibility of uncooperative behavior [28]. Emergency decisions can involve potentially serious risks, as a wrong choice could lead to unforeseen catastrophic consequences [27,29,30]. It has been shown that emergency operations conducted according to existing plans have led to a significant reduction in response times as well as improved coordination, resulting in fewer casualties and less economic damage [27].

R. M. Jaradat advocated for the development of methods capable of addressing the complexity, unpredictability, and uncertainty of complex systems, such as managing sudden emergencies and crisis scenarios [31]. Considering this, it is necessary to be able to structure increasingly better training and education plans to be ready to deal with any emergency when it arises and to cope with its consequences. Creating effective learning environments using simulations enable the development of knowledge and skills which can make social and organizational systems resilient [32]. Of great importance, for this reason, is the knowledge of what might be the specific vulnerabilities of certain groups, in addition to those of the individual, as well as the protective factors capable of promoting resilience, as emerged during the SARS and Ebola epidemics. During these events, communities responded effectively through social cohesion, diligently following basic safety norms [33] to intervene in a timely manner not only from a medical point of view but also a psychological one [34,35]. Various classifications of disasters and related emergencies can be found in the literature [36,37]. These studies agree on dividing disasters into natural and man-made disasters. In the present study, three types of emergencies were considered: natural disasters due to climate change, pandemics, and seismic events.

With reference to the issue of climate change, the literature shows that it is, to date, a source of great concern for a large part of the population not only in Europe but also

worldwide [38–41]. Individuals who have completed a university-level education, as well as those who intend to have children, seem to be the most affected groups in relation to the future challenge posed by climate change [38]. Furthermore, one study found that the effects of climate change events on women are much more pronounced than those for their male counterparts [42].

Regarding the pandemic theme in general, it was pointed out that the most important predictor of fear was gender, followed by age and level of education [43,44]. In accordance with this, it was observed that more educated and competent, married, and older women reported a greater fear of epidemics at various levels [44]. These findings were also confirmed by other research showing that there was greater psychological vulnerability in women during the COVID-19 pandemic [45,46]. However, it should be emphasized that these findings also showed that men tend to adopt less self-care behavior, displaying a lower level of fear, and this characteristic could be an important factor in their exposure to viruses and the consequences of infection [47].

Among the natural events which are impossible to estimate in predictive terms are earthquakes. Previous studies emphasized that survivors and subjects belonging to the female gender reported higher scores on the personal impact factor than male subjects and then those who had never experienced such an event [48–51], although it has also been observed that experience can positively influence preparedness behavior in the face of such disasters [51]. Training in the field of seismic phenomena acts as a protective factor for the population's perception of risk and fear and furthermore increases preparedness levels to respond to such events [50,51]. Gender differences in perceptions of reported stress levels for a population after an earthquake event have been observed. In particular, women reported experiencing higher levels of stress compared with the values reported by men [48]. A further study has highlighted how the elderly population appears to be quite vulnerable due to their sense of attachment to the homes in which they live, and this appears to be an important risk factor capable of causing an underestimation of the actual danger of an earthquake in relation to the safety provisions they receive [52].

Furthermore, high rates of maladaptive behavior have been reported among earthquake survivors with post-traumatic stress disorder, suggesting a greater severity of the phenomenon among male subjects [53].

1.1. Deciding in Critical Contexts

The emergency decision-making environment is characterized by considerable complexity due to several variables: limited reaction time, scarcity of information, and unstable and changing contextual circumstances. This complexity is evident both when making decisions in an emergency operational scenario and at an institutional level [54]. For this reason, “emergency decision making” (EDM) should compel those involved in coping with crises to continuously develop skills and build capacity for maximum optimization of results [55]. As mentioned in the previous section, complexity helps to better understand the type of approach to be used in studying these phenomena. Complexity theory is an interdisciplinary approach which deals with the study of complex systems (i.e., systems consisting of a multitude of interacting components which generate emergent behaviors that are not easily predictable from the characteristics of the individual components). These systems span a wide range of scientific fields. A key concept in complexity theory is self-organization, through which complex systems can generate structures and patterns of behavior without the need for external control. Complexity theory is based on fundamental principles from systems theory, chaos theory, network theory, and information theory [56]. In coping with emergencies, which are well described by complexity theory, decision makers must possess excellent problem-solving skills. In this field, the study of “complex problem solving” (CPS) [26,57–59] has developed over the last 30 years. Complex problem solving (CPS) is an area of cognitive science concerned with studying, under ecological and laboratory conditions, decision makers' approach to solving complex problems [59–61]. Complex problem solving, in turn, is closely related to naturalistic decision scenarios.

Naturalistic decision making (NDM) is concerned with decision making in real-world contexts and thus is a more ecological field of study than its predecessors, thus studying the day-to-day challenges of decision makers in different domains, including emergency decision making [62].

This study is based on the theoretical framework of “emergency decision making” (EDM) and “complex problem solving” (CPS) and constitutes the preliminary phase of a broader research project I am conducting at Sapienza University of Rome. This project, which began in 2022 and is currently ongoing, is titled “Decision-Making Strategies of Expert Decision-Makers Regarding Simulated Emergency Scenarios”. It was conceived following my systematic review study on decision-making processes in emergency contexts within institutions, titled “Leading through crisis: A systematic review of institutional decision-makers in emergency contexts” [54]. In an overview by L. Zhou et al. [3], the key role of proposing a scientific and reasonable method to analyze the effectiveness of EDM in emergency management was emphasized. However, the authors pointed out that despite numerous reviews of EDM conducted on the topic of unforeseen disasters, rather few have been conducted on natural disasters, neglecting the central aspect of decision-making variables related to the human factor [3]. This study, in continuity with the field of EDM and CPS studies, aims to address emergency decision-making issues, focusing on human variables and particularly on psychological variables compared to previous studies. It seeks to establish a starting point for further in-depth studies in this field within the Italian context.

In fact, in this research, we have focused on human decision makers. However, in the contemporary world, we must not overlook the preponderant development that the technological world is experiencing with developments in artificial intelligence (AI) [62]. Only by using a holistic and integrated approach will it be possible to claim to address the issue of emergency decision making with dignity.

1.2. Aim of This Study

The main objective of this research was to identify the scenario chosen most frequently by the participants out of the three proposed, which was suitable for placing the subjects in an emergency context where they were required to make decisions to cope with a problem. The secondary objective, on the other hand, was to explore the possible presence of relationships between the socio-demographic variables of the sample (age, gender, level of education, type of employment, membership of associations working in emergencies, etc.) and the chosen scenario. The scenarios represented three different types of emergencies: climate change, health, and seismic. In particular, the following hypotheses were tested: a contingency relation between gender and the identified emergency scenario (H1); a contingency relation between the type of occupation and the chosen scenario (H2); a contingency relation between the role and the preferred scenario (H3); a contingency relation between the current work activity and the indicated scenario (H4); and a contingency relation between previous experience and the indicated scenario (H5).

2. Methods

An exploratory survey was conducted on a sample of individuals over 18 years old who were healthy in the Italian context, with or without decision-making experience in emergency situations, and who were asked to evaluate and choose one of the three proposed emergency scenarios. Convenience sampling was chosen as the sampling methodology, supplemented by a stratification technique to better represent the components of the target population based on age, gender, education, type and role of employment, geographic origin, affiliation with emergency response organizations, and experience in the emergency field. The criteria I followed for determining the adequacy of the sample size were those of A. L. Comfrey and H. B. Lee [63], who considered a sample size of 300 subjects to be decent and 500 subjects to be good, in line with E. Guadagnoli and W. F. Velicer [64], who emphasized the importance of absolute minimum sample sizes rather than subject-to-

variable ratios. Subjects affiliated with the Applied Experimental Psychology Laboratory at Sapienza University of Rome were initially invited to participate in order to create a stratified database based on the following characteristics: age, gender, education, type and role of employment, geographic origin, affiliation with emergency response organizations, and experience in the emergency field. Subsequently, those subjects who met the inclusion criteria and thus adequately represented the stratification of the target population based on the selected categories were invited to participate in the study. The research was sponsored through common social networks. Participants completed an online questionnaire via the Qualtrics survey platform. Each respondent was given the freedom to voluntarily choose to participate in the study and began completing the online survey after reading and accepting an informed consent form. Maximum discretion was ensured in the administration and analysis of the responses. The study was approved by the ethics committee of Sapienza University of Rome and was conducted in accordance with the parameters of the Declaration of Helsinki. All participants provided written informed consent before participating in the study. Participants were preliminarily asked to report any neurological or psychiatric disorders, and if they did, then they did not continue the study.

This research was conducted from 1 July 2023 to 31 October 2023 using the Qualtrics XM web platform, on which the following were uploaded: a demographic questionnaire, three scenarios to be read with corresponding questions for each of them, and a final question, in which the subject was asked to choose one of the three proposed scenarios. At the end of implementation of the task on the platform, the link was published via the same platform so that it could be accessed by any type of digital device with an internet connection. In order to carry out the following study, an ad hoc questionnaire was constructed, the first part of which contained a section on informed consent and its acceptance, followed by a demographic form that collected the following data: age, gender of the participant, level of education, marital status, the presence of any situations that could jeopardize the possibility of making decisions, as well as the geographical region of origin, type of occupation, membership of voluntary associations, and finally whether the person had ever made decisions in emergency situations in their private lives or at work (Appendix A). The scenarios used represented three different types of emergencies: one proposed the state of emergency inherent to climate change, another proposed the state of emergency inherent to health risk, and the last proposed the state of emergency inherent to seismic events.

The scenarios were constructed based on data on natural risks in Italy, which are publicly available and contained on the website of the National Institute of Statistics (ISTAT), an Italian public research institution responsible for data collection at the national level [65]. The risk categories and respective possible emergencies were identified on the website of the Italian Civil Protection Department, an entity under the direct authority of the Presidency of the Council of Ministers [66]. By combining statistical data with data on major nationally relevant emergencies in Italy, the three scenarios were constructed by simply describing three of the most pertinent emergency phenomena for the Italian population, supported by existing data (Appendix B). Response alternatives for dealing with each event were not provided to the participants at this stage. Thus, the participants were not asked during this phase to make decisions but only to evaluate the scenario and choose one of the proposed options. For each scenario, 10 questions were proposed to probe the subject's degree of agreement expressed on a five-point Likert-type scale (from completely disagree (1) to completely agree (5)) regarding 10 identified dimensions (realism, past realism, future realism, emotions, concern, perceived risk, emergency, catastrophe, immediate choice, and immediate decision) (Appendix C). Regarding the "realism" dimension, the corresponding question was "Is the scenario read close to reality?" This was intended to probe how close to reality the scenario presented was for the individual. Associated with the "emotions" dimension was the question "How emotionally shaken did you feel by the scenario you had just read?" This was intended to probe to what extent the individual was emotionally shaken after reading the scenario. The dimension of "past realism" was associated with

the question “Do you think the scenario can well simulate real-life situations?” This was intended to probe how close to reality the scenario presented was for the individual based on his or her experience. The dimension of “worry” was associated with the question “How worried would you feel if you had to choose an option to deal with the problem?” This was aimed at probing the degree of concern that the scenario could generate in the individual. Associated with the dimension of “future realism” was the question “Do you believe that the scenario can well simulate real situations that might occur?” This was intended to probe how close to reality the scenario presented in the future perspective might be for the individual. The “perceived risk” dimension was associated with the question “How possible are the risks listed in the scenario?” This was intended to probe how possible the risks listed in the scenario were for the individual. The “immediate choice” dimension was associated with the question “Do you believe you can arrive at the solution immediately?” This was intended to probe how ready the individual might be to make an immediate choice to deal with the emergency posed by the scenario. The “emergency” dimension was associated with the question “Do you believe that this scenario can be understood as an emergency condition?” This was intended to probe the extent to which the individual perceived the situation presented in the scenario as an emergency. The “immediate decision” dimension was associated with the question “Do you believe you can make a decision in a short time regarding the scenario?” This was intended to probe how prepared the individual might be to make an immediate decision to cope with the emergency. The “catastrophe” dimension was associated with the question “Do you believe that this scenario can be defined as a catastrophic situation?” This question was aimed at probing the extent to which the individual perceived the situation presented in the scenario as a catastrophe. Finally, participants were asked the final question: “Which of the three scenarios faithfully reproduces an emergency condition in which a subject is called upon to make a decision in order to cope with the event?” For this question, the individual could only choose one of the three alternatives, corresponding to the three emergency scenarios presented (Appendix D).

2.1. Participants and the Sample’s Characteristics

The final sample included 348 people (Table 1), with 137 men (39.4%), 207 women (59.5%), 1 non-binary participant, (0.3%) and 3 people of other genders (0.8%). The average age of the participants was 40.3 years ($SD = 14.4$). All participants had at least 8 years of education; specifically, 34.2% held a bachelor’s degree, 25.9% held a secondary school diploma, 25% held a secondary school license, 9.5% held a master’s or PhD, and 5.5% held a master’s degree (Table 2). With reference to marital status, 25.9% of the participants declared themselves single and in a relationship, 6.3% were separated, 2.3% were widowed, 22.1% were single but not in a relationship, 39.7% were married or cohabiting, and finally, 3.75 were divorced. The participants were Italian (Table 3) and came, for the most part, from the Lazio region (34.5%) and the Campania region (26.7%). Regarding the participants’ occupational employment and the relative roles they held, it is possible to see these in the corresponding tables (Tables 4 and 5, respectively).

Table 1. Total number of participants and gender breakdown.

		Frequency	Percentage
Gender	Man	137	39.4
	Women	207	59.5
	Non-binary	1	0.3
	Other	3	0.9
	Total	348	100.0

Table 2. Breakdown by educational qualification held by participants.

Qualification		Frequency	Percentage
	Middle school diploma	87	25.0
	High school diploma	90	25.9
	Bachelor's degree	119	34.2
	Master's degree	19	5.5
	Master's or PhD	33	9.5
Total		348	100.0

Table 3. Breakdown by region of domicile of participants.

Domicile Region		Frequency	Percentage
	Abruzzo	6	1.7
	Basilicata	5	1.4
	Calabria	7	2.0
	Campania	93	26.7
	Emilia Romagna	9	2.6
	Friuli Venezia Giulia	7	2.0
	Lazio	120	34.5
	Liguria	8	2.3
	Lombardia	17	4.9
	Marche	6	1.7
	Molise	4	1.1
	Piemonte	12	3.4
	Puglia	10	2.9
	Sardegna	5	1.4
	Sicilia	6	1.7
	Toscana	14	4.0
	Trentino Alto Adige	6	1.7
	Umbria	3	0.9
	Valle d'Aosta	4	1.1
	Veneto	6	1.7
Total		348	100.0

Table 4. Breakdown of participants by employment.

Employment		Frequency	Percentage
	Student	83	23.9
	Unemployed	52	14.9
	Public employment	95	27.3
	Private employment	81	23.3
	Self-employed	37	10.6
Total		348	100.0

Table 5. Breakdown of participants by job role.

Role	Frequency		Percentage
	Worker or Laborer	21	6.0
	Employee or Officer	113	32.5
	Manager	10	2.9
	Other or Self-employed	69	19.8
	Total	213	61.2
Students or Unemployed *		135	38.8
Total		348	100.0

* Note: The category “Students or Unemployed” (38.8% of the sample) was not considered for the purposes of the role question, as only those who stated they were employed could answer this question.

The largest number of participants came from the public employment sector (27.3%), followed by students (23.9%) and private sector employees (23.3%). The “Clerical or Employee” category was the largest job role category (32.5%) out of the total number of participants. The category “Students, Unemployed, or Occupied” (38.8%) was not considered for the purpose of roles, as only those who had declared themselves to be employed could answer this question. Meanwhile, 39.7% of the 213 working participants stated that their working positions did not involve decision making in the emergency field, while the remaining 21.6% answered in the affirmative (Table 6). Finally, 67.5% of the total sample stated that they had never made decisions in the past in a work context during emergency situations, against 32.5% who answered in the affirmative (Table 7).

Table 6. Worker participants’ answers to the question “Does your job position involve decision making in emergency and/or risk situations?”.

“Does your job position involve decision making in emergency and/or risk situations?”	Frequency		Percentage
	Yes	75	21.6
	No	138	39.7
	Total	213	61.2
	Students or Unemployed *	135	38.8
Total		348	100.0

* Note: The category “Students or Unemployed” (38.8% of the sample) did not answer this question as it was only proposed to those who stated that they were employed.

Table 7. Participants’ answers to the question “Have you ever had to manage and/or decide in emergency situations for work?”.

“Have you ever had to manage and/or decide in emergency situations for work?” *	Frequency		Percentage
	Yes	113	32.5
	No	235	67.5
Total		348	100.0

* Note: All participants were given the opportunity to answer this question as anyone, even in the past, could have found themselves in the situation of having to make emergency decisions in work contexts.

2.2. Statistical Analysis

The data analyses were conducted using IBM SPSS statistical processing software (version 27). Before conducting the data analyses, all variables were examined for accuracy of data entry and the presence of missing values. Descriptive statistics were carried out on all socio-demographic variables considered in the study: age, gender, level of education, marital status, problems that could impair the ability to make decisions, region of origin,

occupation, membership of emergency organizations, whether they were able to make decisions in emergencies based on their work or private life, or whether they had ever made decisions in emergencies, as outlined in the previous section. Subsequently, the frequency distribution was recorded for the questions referred to in the three questionnaires answered by the subjects. Then, to verify the presence of relationships between the sample variables and the choice of scenario made by the subjects, contingency tables were created. Contingency tables are two-way tables in which each cell indicates the unique observed value. They report the joint frequencies of the variables. By using contingency tables and performing specific calculations on them, the dependence or independence between the considered variables will be determined based on the value assumed by Pearson's chi-squared (χ^2) statistic. Where necessary, the Cramér V statistical test was also calculated to test the strength of the relationships between variables that emerged from Pearson's chi-squares test.

3. Results

The sample response frequencies for the questions in the questionnaire for each scenario presented will be reported below. Specifically, the answers that reported the highest frequencies for each scenario will be illustrated. Regarding the "realism" dimension, for the question "Is the scenario you read close to reality?" 45.7% of the sample with 159 subjects answered "quite agree" for the Ebola epidemic scenario; 43.1% of the sample with 150 subjects answered "quite agree" for the seismic swarm scenario; and 45.4% of the sample with 158 subjects answered "quite agree" for the climate change scenario. Regarding the "emotions" dimension, for the question "How emotionally shaken did you feel by the scenario you had just read?" 48.6% of the sample with 169 subjects answered "fairly agree" for the Ebola epidemic scenario; 44.8% of the sample with 156 subjects answered "fairly agree" for the climate change scenario; and 41.4% of the sample with 144 subjects answered "fairly agree" for the earthquake swarm scenario. With regard to the dimension of "past realism", for the question "Do you believe that the scenario can well simulate situations that really happened?" 56.3% of the sample with 196 subjects answered "quite agree" for the Ebola epidemic scenario; 51.1% of the sample with 178 subjects answered "quite agree" for the climate change scenario; and 46.3% of the sample with 161 subjects answered "quite agree" for the earthquake swarm scenario. Regarding the dimension of "concern", for the question "How concerned would you feel if you had to choose an option to deal with the problem?" 45.4% of the sample with 158 subjects answered "fairly agree" for the Ebola epidemic scenario; 41.1% of the sample with 143 subjects answered "fairly agree" for the climate change scenario; and 35.3% of the sample with 123 subjects answered "fairly agree" for the earthquake swarm scenario. With regard to the dimension of "future realism", for the question "Do you believe that the scenario can well simulate real situations that could happen?" 52.3% of the sample with 182 subjects answered "fairly well" for the Ebola epidemic scenario; 51.7% of the sample with 180 subjects answered "fairly well" for the climate change scenario; and 46.6% of the sample with 162 subjects answered "fairly well" for the earthquake swarm scenario. Regarding the dimension of "perceived risk", for the question "How likely are the risks listed in the scenario?" 46.0% of the sample with 160 subjects answered "fairly strongly agree" for the Ebola epidemic scenario; 48.9% of the sample with 170 subjects answered "fairly strongly agree" for the climate change scenario; and 44.0% of the sample with 153 subjects answered "fairly strongly agree" for the earthquake swarm scenario. With regard to the "immediate choice" dimension, for the question "Do you think you can reach a solution immediately?" 35.6% of the sample with 124 subjects answered "fairly strongly disagree" for the Ebola epidemic scenario; 31.0% of the sample with 108 subjects answered "fairly strongly disagree" for the climate change scenario; and 34.2% of the sample with 119 subjects answered "fairly strongly disagree" for the earthquake swarm scenario. Regarding the "emergency" dimension, for the question "Do you believe that this scenario can be understood as an emergency condition?" 43.4% of the sample with 151 subjects answered "fairly agree" for the Ebola epidemic scenario; 41.1%

of the sample with 143 subjects answered “fairly agree” for the climate change scenario; and 36.5% of the sample with 127 subjects answered “fairly agree” for the earthquake swarm scenario. Concerning the dimension “immediate decision”, for the question “Do you think you can make a decision in a short time regarding the scenario?” 31.0% of the sample with 108 subjects answered “quite disagree” for the Ebola epidemic scenario; 30.7% of the sample with 107 subjects answered “quite disagree” for the climate change scenario; and 34.8% of the sample with 121 subjects answered “quite disagree” for the earthquake swarm scenario. Regarding the “catastrophe” dimension, for the question: “Do you believe that this scenario can be defined as a catastrophic situation?” 39.9% of the sample with 139 subjects answered “fairly agree” for the Ebola epidemic scenario; 36.5% of the sample with 127 subjects answered “fairly agree” for the climate change scenario; and 30.7% of the sample with 107 subjects answered “fairly agree” for the earthquake swarm scenario.

For the final question “Which of the three scenarios faithfully reproduces an emergency condition in which a subject is called upon to make a decision in order to cope with the event?” 43.4% of the sample with 151 subjects chose the “Ebola epidemic” scenario; 33.6% of the sample with 117 subjects chose the “climate change” scenario; and 23.0% of the sample with 80 subjects chose the “earthquake swarm” scenario (Table 8).

Table 8. Frequency distribution of participants’ final choice of scenario most likely to reproduce a decision-making condition in an emergency.

		Frequency	Percentage
“Which of the three scenarios accurately reproduces an emergency condition in which a person is called upon to make a decision to cope with the event?”	Ebola Epidemic Emergency	151	43.4
	Seismic Swarm Emergency	80	23.0
	Climate Change Emergency	117	33.6
	Total	348	100.0

Using contingency tables, the participants’ choices were analyzed in relation to the specific characteristics of the sample. The first contingency table includes gender and the type of scenario chosen as factors as well as the corresponding Pearson’s chi-squared test (Table 9).

Table 9. Contingency table and its corresponding Pearson’s chi-squared test for “gender”. * “Which of the three scenarios accurately reproduces an emergency condition in which a person is called upon to make a decision in order to cope with the event?”.

“Which of the Three Scenarios Accurately Reproduces an Emergency Condition in Which a Person Is Called Upon to Make a Decision to Cope with the Event?”					
		Ebola Epidemic Emergency	Seismic Swarm Emergency	Climate Change Emergency	Total
Gender	Man	70	30	37	137
	Women	79	49	79	207
	Non-binary	1	0	0	1
	Other	1	1	1	3
Total		151	80	117	348

Table 9. Cont.

“Which of the Three Scenarios Accurately Reproduces an Emergency Condition in Which a Person Is Called Upon to Make a Decision to Cope with the Event?”			
	Ebola Epidemic Emergency	Seismic Swarm Emergency	Climate Change Emergency
χ^2 Test			
	Value	Degrees of Freedom	Asymptotic (Two-Tailed) Significance
Pearson’s chi-squared test	7.858 ^a	6	0.249
Likelihood ratio	8.242	6	0.221
Linear-by-linear association	4.814	1	0.028
Number of valid cases	348		

^a Six cells (50.0%) had an expected count less than 5. The minimum expected count was 0.23.

The second contingency table includes the participants’ region of domicile and the type of scenario chosen as factors, as well as the corresponding Pearson’s chi-squared test (Table 10).

Table 10. Contingency table and its corresponding Pearson’s chi-squared test for domicile region.
 * “Which of the three scenarios faithfully reproduces an emergency condition in which a person is called upon to make a decision in order to cope with the event?”.

“Which of the Three Scenarios Accurately Reproduces an Emergency Condition in Which a Person Is Called Upon to Make a Decision to Cope with the Event?”					
		Ebola Epidemic Emergency	Seismic Swarm Emergency	Climate Change Emergency	Total
Domicile Region	Abruzzo	2	4	0	6
	Basilicata	2	2	1	5
	Calabria	2	4	1	7
	Campania	24	26	43	93
	Emilia Romagna	5	1	3	9
	Friuli Venezia Giulia	4	0	3	7
	Lazio	43	32	45	120
	Liguria	6	0	2	8
	Lombardia	15	0	2	17
	Marche	3	2	1	6
	Molise	2	1	1	4
	Piemonte	10	0	2	12
	Puglia	5	2	3	10
	Sardegna	3	0	2	5
	Sicilia	4	1	1	6
	Toscana	11	1	2	14
	Trentino Alto Adige	4	1	1	6
	Umbria	0	3	0	3
	Val d’Aosta	2	0	2	4
	Veneto	4	0	2	6
	Total		151	80	117

Table 10. Cont.

“Which of the Three Scenarios Accurately Reproduces an Emergency Condition in Which a Person Is Called Upon to Make a Decision to Cope with the Event?”			
	Ebola Epidemic Emergency	Seismic Swarm Emergency	Climate Change Emergency
χ^2 Test			
	Value	Degrees of Freedom	Asymptotic (Two-Tailed) Significance
Pearson’s chi-squared test	82.764	38	0.000
Likelihood ratio	93.413	38	0.000
Linear-by-linear association	14.877	1	0.000
Number of valid cases	348		

* Fifty cells (83.3%) had an expected count less than 5. The minimum expected count was 0.69.

The third contingency table includes the participants’ sectors of employment and the type of scenario chosen as factors, as well as the corresponding Pearson’s chi-squared test (Table 11).

Table 11. Contingency table and its corresponding Pearson’s chi-squared test for employment.
* “Which of the three scenarios accurately reproduces an emergency condition in which a person is called upon to make a decision in order to cope with the event?”.

“Which of the Three Scenarios Accurately Reproduces an Emergency Condition in Which a Person Is Called Upon to Make a Decision to Cope with the Event?”				
		Ebola Epidemic Emergency	Seismic Swarm Emergency	Climate Change Emergency
		Total		
Employment	Student	30	18	35
	Unemployed	21	12	19
	Public employment	47	23	25
	Private employment	35	17	29
	Self-employed	18	10	9
Total		151	80	117
χ^2 Test				
		Value	Degrees of Freedom	Asymptotic (Two-Tailed) Significance
Pearson’s chi-squared test		7.195	8	0.516
Likelihood ratio		7.288	8	0.506
Linear-by-linear association		3.173	1	0.075
Number of valid cases		348		

* Zero cells (0.0%) had an expected count less than 5. The minimum expected count was 8.51.

The fourth contingency table includes as factors the role played by the participants who said they had jobs and the type of scenario chosen, as well as the corresponding Pearson’s chi-squared test (Table 12).

Table 12. Contingency table and its corresponding Pearson’s chi-squared test for role. * “Which of the three scenarios accurately reproduces an emergency condition in which a subject is called upon to make a decision to cope with the event?”.

		“Which of the Three Scenarios Accurately Reproduces an Emergency Condition in Which a Person Is Called Upon to Make a Decision to Cope with the Event?”			
		Ebola Epidemic Emergency	Seismic Swarm Emergency	Climate Change Emergency	Total
Role	Worker or laborer	5	6	10	21
	Employee or officer	57	25	31	113
	Manager	7	2	1	10
	Other or self-employed	31	17	21	69
	Total	100	50	63	213
χ^2 Test					
		Value		Degrees of Freedom	Asymptotic (Two-Tailed) Significance
Pearson’s chi-squared test		8.092		6	0.231
Likelihood ratio		8.549		6	0.201
Linear-by-linear association		0.468		1	0.494
Number of valid cases		213			

* Four cells (33.3%) had an expected count less than 5. The minimum expected count was 2.35.

The fifth contingency table includes as factors the participant’s job position, which may or may not involve decision making in emergency or risk situations, and the type of scenario chosen, as well as THE corresponding Pearson’s chi-squared test (Table 13).

Table 13. Contingency table and its corresponding Pearson’s chi-squared test for the question “Does your job position involve decision making in emergency and/or risk situations?” * “Which of the three scenarios accurately reproduces an emergency condition in which an individual is called upon to make a decision to cope with the event?”.

		“Which of the Three Scenarios Accurately Reproduces an Emergency Condition in Which a Person Is Called Upon to Make a Decision to Cope with the Event?”			
		Ebola Epidemic Emergency	Seismic Swarm Emergency	Climate Change Emergency	Total
“Does your job position involve decision making in emergency and/or risk situations?”	YES	26	25	24	10
	NO	74	25	39	69
	Total	100	50	63	213
χ^2 Test					
		Value		Degrees of Freedom	Asymptotic (Two-Tailed) Significance
Pearson’s chi-squared test		8.742		2	0.013
Likelihood ratio		8.709		2	0.013
Linear-by-linear association		3.389		1	0.066
Number of valid cases		213			

* Zero cells (0.0%) had an expected count less than 5. The minimum expected count was 17.61.

The sixth contingency table includes as factors the possibility of having decided in a work emergency in the past and the chosen scenario, as well as the corresponding Pearson's chi-squared test (Table 14).

Table 14. Contingency table and its corresponding Pearson's chi-squared test for the question "Have you ever had to manage and/or decide in emergency situations for work?" * "Which of the three scenarios accurately reproduces an emergency condition in which a person is called upon to make a decision to cope with the event?"

"Which of the Three Scenarios Accurately Reproduces an Emergency Condition in Which a Person Is Called Upon to Make a Decision to Cope with the Event?"					
		Ebola Epidemic Emergency	Seismic Swarm Emergency	Climate Change Emergency	Total
"Have you ever had to manage and/or decide in emergency situations for work?"	Yes	43	32	38	113
	No	108	48	79	235
	Total	151	80	117	348
χ^2 Test					
		Value		Degrees of Freedom	Asymptotic (Two-Tailed) Significance
Pearson's chi-squared test		3.167		2	0.205
Likelihood ratio		3.122		2	0.210
Linear-by-linear association		0.627		1	0.429
Number of valid cases		213			

* Zero cells (0.0%) had an expected count less than 5. The minimum expected count was 25.98.

4. Discussion

The emergency scenario in written form most frequently chosen by the reference sample, which was able to faithfully reproduce a decision-making condition in an emergency, was one that represented a health emergency in Europe. Specifically, the scenario simulated an Ebola epidemic in the face of which the subject, in the role of an institutional decision maker, was called upon to place him or herself in the position of having to decide to cope with the problem. This scenario was chosen by 43.4% of the total sample but also obtained the highest degree of agreement for each of the 10 dimensions (realism, past realism, future realism, emotions, concern, perceived risk, emergency, catastrophe, immediate choice, and immediate decision) compared with the other two scenarios.

Currently, in the scientific landscape of the Italian context in the field of EDM, there has been no study that evaluated emergency scenarios in written form from a sample drawn from the general population. This could be the first contribution to addressing the theoretical and practical need, highlighted by scholars such as J. Funke et al. (2018) and M.R. Jaradat (2015), to provide tools and methodologies to support the study of decision-making skills in emergencies [21,31].

The relationship between demographic characteristics and perceptions of emergencies illustrates how different factors, including gender, occupation type, role, emergency employment status, or experience, are differently related to the choice of the proposed emergency decision-making scenarios. This research confirms the complexity and variability of participants' evaluation of what is perceived as an emergency or crisis.

The contingency relationship based on the first hypothesis formulated between gender and the emergency scenario chosen showed that participants belonging to the female gender (207 subjects) expressed equal preference for the health emergency scenario (79 subjects)

and the climatic emergency scenario (79 subjects) compared with the seismic emergency scenario, which was in the minority (49 subjects). Meanwhile, the participants belonging to the male gender (137 subjects) expressed a majority preference for the health emergency scenario (70 subjects) compared with the seismic emergency (30 subjects) and climatic emergency (37 subjects) scenarios. The analysis thus revealed that women were more sensitive toward the choice of health and climate emergency scenarios in equal measure, while men showed a greater inclination toward the choice of the health emergency scenario. However, no significant relationship emerged in Pearson's chi-squared (χ^2) statistical test.

The contingency relation formulated in the second hypothesis between the type of occupation and scenario chosen show that the health emergency scenario was chosen more by workers in the public sector (47 preferences) and the private sector (35 preferences) compared with students, who chose the climate emergency scenario more often (35 preferences), while those who were not employed (21 preferences) or were freelancers (18 preferences) also chose the health emergency scenario more often. The results show that workers in the public and private sectors were more likely to choose the health emergency scenario than students, who were more likely to choose the climate emergency, but no significant relationship emerged in the Pearson's chi-squared (χ^2) statistical test. This could be explained by the greater exposure and responsibility that workers in the public and private sectors may have with regard to the direct management of health crises, which may also be related to a question of safety regulations in the workplace, while students may be more sensitive to emerging environmental issues related to the activities of student movements, which are often active all over the world and especially in Europe, and their manifesting various issues affecting the planet, including climate change.

The contingency relation according to the third hypothesis formulated between role and preferred scenario shows that the health emergency scenario was chosen most among workers who declared that they belonged to the category of clerk, executive, or manager (47 preferences) or the private sector (35 preferences). Another interesting fact is that only one participant belonging to the executive or manager category chose the climate emergency scenario. In this case as well, no significant relationship emerged between the variables under consideration (role and scenario choice) in the Pearson's chi-squared (χ^2) statistical test. These data can be read in the light of the recent Covid-19 pandemic, which had strong repercussions on working patterns in the white collar and middle management or cadre categories, and the extremely low sensitivity of executives and managers to climate-related emergency issues is because they are more focused on indiscriminately maximizing profits and productivity.

The contingency relation according to the fourth hypothesis shows that among the subjects of the sample who declared themselves to be workers, those who answered "Yes" when asked the question "Does your job position involve making decisions in emergency and/or risk situations?" chose the health emergency scenario in 26 subjects, the seismic emergency scenario in 25 subjects, and the climatic emergency scenario in 24 subjects. Those who answered "No" in the same subgroup of workers chose the health emergency scenario in 74 subjects, the earthquake emergency scenario in 25 subjects, and the climate emergency scenario in 39 subjects. In this case, crossing the experiential and work variable with the scenario choice revealed a low, statistically significant relationship in the Pearson's chi-squared (χ^2) statistical test, with $n = 213$, $\chi^2(2) = 8.74$, and $p = 0.013$. To measure the strength of the association between the variables of the chi-squared test, the Cramér's V statistical test was also conducted, yielding $\varphi = 0.20$. Although the association was statistically significant, the variables were only weakly associated. Interestingly, the workers who had decision-making responsibilities in emergency or risk situations tended to distribute their preferences equally among all three scenarios, suggesting greater awareness and sensitivity to various types of crises. In contrast, those without such responsibilities showed a greater bias toward the health scenario, perhaps reflecting a more media-focused perception of emergencies such as pandemics.

The contingency relation based on the fifth hypothesis formulated shows that between previous experience and the scenario indicated, when “Have you ever had to manage and/or decide in emergency situations for work?” was asked, of the 235 subjects who answered “No”, 108 subjects chose the epidemic scenario, and of the 113 subjects who answered “Yes”, 43 subjects chose the epidemic scenario. In this case as well, no significant relationship emerged between the variables under consideration (role and scenario choice) in the Pearson’s chi-squared (χ^2) statistical test. These data suggest that those with no previous experience in emergency decision making preferred the epidemic scenario, perhaps influenced by the recent media coverage related to the COVID-19 pandemic, as opposed to those with previous experience in this area.

One of the limitations of this study was the use of a non-probabilistic sampling technique integrated with a probabilistic methodology, such as stratification. Although the sample size was justified in light of the work of Comfrey and Lee (1992) and Guadagnoli and Velicer (1988), it seems appropriate to suggest a future replication of this study using a pure probabilistic sampling methodology, following the guidelines of sampling techniques which consider a subject-to-variable ratio of 20:1, as suggested, for example, by J.W. Osborne and A.B. Costello (2019) [67]. Another limitation to consider is the lack of validation of the 10 question scale, visible in Appendix C, which was used to evaluate the scenarios. However, the objective of the study was not to develop a questionnaire or scale as a “tool” and thus become subject to validation and consistency analysis but simply to choose one among the three proposed scenarios, as specified in the objectives. Considering this, I thought about it, and based on the relevant literature, I was highly sceptical about proceeding with a validation study. In fact, Koller et al. (2017) emphasized that content validity is still rarely mentioned in psychological journal studies and systematically analyzed even less often [68], but it receives particular attention in other disciplines, such as nursing research [69].

Another limitation is the use of a rather simple statistical methodology. However, it did not seem appropriate to use other statistical methodologies given the small amount of data in relation to the main purpose of the study. The main objective of this research was achieved by the sample’s identification of the most suitable written scenario for the Italian context in simulating an emergency decision-making condition. This scenario will be used in the next phase of research related to the larger research project I am conducting at Sapienza University of Rome, which began in 2022 and is ongoing, titled “Decision-Making Strategies by Expert Decision-Makers Regarding Choices in Simulated Emergency Scenarios”. The next phase of the research will involve administering this scenario to two groups: one consisting of expert decision makers in emergency management and the other consisting of non-experts. Participants will be asked to find a solution to address the emergency and provide an immediate response. Additionally, the decision-making style, emotional intelligence, propensity for maximization, level of indecision, and self-efficacy of the participants will also be evaluated.

5. Conclusions

In response to the emerging need in public policy sectors, particularly in emergency management, over the past decades regarding the evolving nature and increasing complexity of emergency events highlighted by L.K. Comfort [20], this study operated with a different approach, starting from the grassroots level rather than the usual pyramidal and hierarchical organization through which institutions operate. The results obtained in this study underscore the need to consider a variety of demographic and professional factors in emergency preparedness and training. Despite scholars such as D. Dörner and C.D. Güss [25] emphasizing that being prepared and experienced sometimes is not enough to handle sudden crises well, I believe that while taking into account the natural limitations of human cognition, as these same scholars highlighted, solid preparation and ongoing training based on the use of simulations are indispensable to ensuring good response standards for dealing with emergencies, in line with the continuity of thought expressed by J. Funke

et al. [21]. Adopting a holistic and integrated approach, including an understanding of gender dynamics, employment, and other socio-cultural factors, can help to better understand the way decision makers think and evaluate and thus significantly improve their decision making effectiveness in crisis situations. Using such data and similar research can guide training and education programs to help develop more effective strategies to serve decision makers and emergency managers. Adequate preparation and in-depth knowledge of the variables that come into play in the assessment of emergencies is one of the main factors of preparedness and resilience against sudden and unpredictable emergencies for experts in the field and those who are less experienced. To address the need for creating effective learning environments using simulations, as highlighted by W.C. Kriz (2003), I wanted to establish a starting point in the Italian scientific landscape in the field of EDM that would allow for the development of an initial knowledge base in an area, such as emergency management, that is constantly evolving. This is aimed at fostering the development of a higher degree of resilience in social and organizational systems [32]. Therefore, this work was designed as an exploratory database to provide experts in the field with the opportunity to learn even more about the studied context and phenomena and to continue to expand the body of knowledge on emergency decision-making issues.

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Institutional Review Board Statement: This study was conducted in accordance with the Declaration of Helsinki and approved by the Transdisciplinary Research Ethics Committee of Sapienza University of Rome (ID: 33/2023, dated 17 April 2023) for studies involving humans.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data from this research can be requested from the following e-mail address: ivan.dalessio@uniroma1.it.

Conflicts of Interest: The author declares no conflicts of interest.

Appendix A

Demographic Questionnaire

1. **Age:** _____;
2. **Gender:** _____;
3. **Education Level:** Middle School; High School; Bachelor's Degree; Master's Degree; PhD;
4. **Region of Residence:** _____;
5. **Marital Status:** Single; Married; Separated; Divorced; Widowed;
6. **Occupation:** Student; Unemployed; Manual Worker; Clerk or Employee; Executive or Manager;
7. **Public Employment:** Yes or No; Private Employment, Yes or No;
8. **Volunteer Organizations/Associations:** Yes or No;
9. **Institutional Role** (Government Institutions, Military or Police Forces, Civil Protection, Municipality, Province, Region, etc.): Yes or No;
10. **Work Sector:** (Defense, Civil Protection, Education, ICT, etc.): _____;
11. **Do you have any issues that may compromise decision-making abilities?** Yes or No;
12. **Do you have any diagnosed decision-making issues due to neuropsychological, neurological, or psychiatric disorders?** Yes or No;
13. **Do you take medication or substances that may compromise decision-making abilities?** Yes or No;
14. **Does your job involve making decisions in emergency or risk situations?** Yes or No;
15. **Do you have any issues that may compromise the ability to make choices?** Yes or No;
16. **Have you ever had to manage or make decisions in emergency situations for work?** Yes or No.

Appendix B

Appendix B.1. Health Emergency: Ebola Epidemic in Europe

In Europe, a sudden epidemic of Ebola erupts due to a new and unknown variant of the virus. It should be considered that the mortality rate for those who contract the virus ranges from 30% to 90%. Currently, there is only one type of medicine that can counteract the spread of this new variant and be decisive for treatment of the sick. Currently, there are 447 million citizens to be saved in Europe. Considering the current global economic and financial situation, European budgetary policies aimed at balancing the books and ensuring market stability must be considered. Maintaining a good level of competitiveness and therefore implementing strategies for the development and enhancement of businesses and research is another fundamental pillar for the European community. Finally, it is necessary to maintain stable welfare policies aimed at supporting the most vulnerable segments of the European population. The molecule useful for potentially combating the virus costs EUR 400 per person. Your figure has been chosen as part of the civic committee that will make important decisions together with international experts regarding the future of European Union citizens. The future of Europe is in your hands. Good luck.

Appendix B.2. Global Climate Change Emergency

In Italy, according to the 2020 ISTAT Report on climate in the regional capitals, the average annual temperature showed an anomaly of +1.2 °C compared with the climatic values for observations made from 1971 to 2000. Climate change is evident to everyone, and it is inevitable to deny its repercussions in the agricultural world as well as in civil protection, given the disasters that have intensified in recent years. At the United Nations Climate Change Conference COP26 held in November 2021, 197 countries pledged to limit temperatures to 1.5 °C below critical thresholds by adopting the Glasgow Climate Pact. In 2020, the average temperature recorded in the 24 regional capitals in Italy was +16.3 °C, an increase of 0.3 °C compared with the corresponding average value for the decade from 2006 to 2015. The climate of the Italian peninsula is increasingly taking on the characteristics of a typical tropical climate, with reference to the phenomena of storms and cyclones. National and international experts reiterate that we are in a climate emergency, and the data come not only from the meteorological sector but also from the agricultural, industrial, and zoological sectors. Official climate reports from Italy for the year 2022 reported that from January to July of the same year, more than 120 adverse weather events were recorded, the highest number compared with the annual average of the last decade. This is a record, considering that from 2010 to today, more than 1300 adverse weather events have occurred on our peninsula. More than 600 Italian municipalities have reported extensive damage. The numbers are staggering: 500 floods from heavy rains, 350 damage reports from tornadoes, 150 reports of damage to infrastructure caused by the intensity of rainfall, 120 river floods (with damages), 62 damage reports from hail, 53 damage reports from prolonged drought, more than 50 landslides from heavy rains, 20 damage reports to historical heritage, and 18 extreme temperature cases in cities. These are clearly red alert data, and it is difficult to pretend not to see because this situation is evident to everyone, entering common daily life and causing extensive, sometimes fatal damage. Your figure has been chosen as part of the civic committee that will make important decisions together with national experts regarding the climatic future of the peninsula.

Appendix B.3. Seismic Swarm Emergency

In the regions of central Italy, intense seismic activity is currently unfolding. The phenomenon of seismic swarms has been intensifying in recent decades, posing serious difficulties for thousands of people and local authorities who, caught off guard, find themselves facing dangerous and unexpected events. Immediately, previous seismic events come to mind, such as Conza (AV) in 1980 (Richter magnitude: 6.9; 2914 deaths), San Giuliano (CB) in 2002 (Richter magnitude: 6; 30 deaths), L'Aquila in 2009 (Richter magnitude:

5.9; 309 deaths), and Accumoli (RI) in 2016 (Richter magnitude: 6; 299 deaths). The highest national authorities are constantly monitoring the situation, and several scholars of the phenomenon, who are of international prominence, emphasize that there are no certainties about when or where precisely a hypothetical major seismic event could occur. Moreover, it might not occur at all. However, previous data on the phenomenon show that every seismic swarm confined to a certain period and geographic area has later led to a major seismic event, causing extensive damage and casualties in the population. The events mentioned earlier serve as a valid example. Your figure has been selected as a member of the civic committee that supports the technical-scientific committee in the imminent decision to be made regarding the massive seismic swarm currently occurring. The votes are evenly split, and only your vote is missing. Based on your decision, we will proceed.

Appendix C

Questionnaire associated with each scenario (10 dimensions).

Five-point Likert scale (from completely disagree (1) to completely agree (5)).

“REALISM”

1. Is the scenario you just read close to reality?

“EMOTIONS”

2. How emotionally shaken did you feel by the scenario you just read?

“PAST REALISM”

3. Do you believe the scenario can effectively simulate real-life situations?

“CONCERN”

4. How concerned would you feel if you had to choose an option to deal with the problem?

“FUTURE REALISM”

5. Do you believe the scenario can effectively simulate real situations that could occur?

“PERCEIVED RISK”

6. How likely are the risks listed in the scenario?

“IMMEDIATE CHOICE”

7. Do you believe you can arrive at a solution immediately?

“EMERGENCY”

8. Do you believe this scenario can be considered an emergency?

“IMMEDIATE DECISION”

9. Do you believe you can make a quick decision regarding the scenario?

“CATASTROPHE”

10. Do you believe this scenario can be defined as a catastrophic situation?

Appendix D

Final question

“Which of the three scenarios accurately reproduces an emergency condition in which an individual is called upon to decide to cope with the event?”

1. **Ebola Epidemic Emergency**
2. **Climate Change Emergency**
3. **Seismic Swarm Emergency**

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