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THE POPULATION OF MILA FACING THE EARTHQUAKE OF AUGUST 07, 2020

Farida Sehili

*Department of architecture, Institut of architecture and earth sciences,
University Ferhat Abbas Setif 1*

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ABSTRACT

The surge in urbanization within regions vulnerable to seismic activity poses a significant escalation in seismic risks. Effective mitigation strategies, reliant on improved architectural practices and behavioral adaptations, are imperative to curtail the toll of seismic events. Seismic vulnerability, intricately intertwined with seismic hazard, building conditions, and populace preparedness, underscores the need for comprehensive risk assessment. Although studies elucidating seismic risk knowledge and behaviors are scant in Algeria, they are more prevalent in Mediterranean regions. This paper delves into the examination of risk culture, discerning both direct and indirect causative factors behind the seismic disaster that befell Mila on August 7, 2020. Employing a research methodology that integrates the method Did You Feel It (DYFI USGS) with a survey model used in Beirut, Lebanon. The findings offer notable insights for two principal reasons. Firstly, local perceptions of the seismic event's severity surpassed estimates by the US Geological Survey (USGS). Secondly, despite the relatively minor magnitude of seismic effects in the El Kherba neighborhood, the populace displayed inadequate preparedness for future earthquakes. Additionally, site-specific factors exerted substantial influence on crisis outcomes. In this context, the preparedness of Algerian society for seismic risks depends on understanding the phenomenon, recognizing associated hazards, and identifying available resources.

Contribution: This study serves as a pivotal resource for fostering proactive local population preparedness and mitigating natural risks. Furthermore, it seeks to augment the efficacy of policies aimed at managing natural disaster risks in Algeria.

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1. Introduction.

Urbanization and human activities contribute to a statistically higher incidence of seismic disasters. In interviews and feedback gathered following seismic events, crisis managers have consistently reported behaviors that they deem "inappropriate" or "dangerous." These behaviors encompass a failure to adhere to preventative and safety guidelines, regulatory requirements aimed at reducing vulnerability, and a lack of preparedness within certain households. However, the mitigation of casualties can only be achieved through a more effective alignment of architectural structures and individual behaviors. Seismic vulnerability hinges on the state of buildings and the readiness of the population. The implementation of seismic construction techniques is significantly contingent on the

national regulatory framework. Residents can enhance their preparedness by taking control of their building structures, fostering resilient urban planning (including street dimensions, building placement, and strategic resources), adapting their homes and workplaces for disaster preparedness (ensuring furniture safety), receiving training in survival skills, and establishing evacuation plans (E. Beck and al. 2019). Preparing individuals for earthquake risks relies on their comprehension of the phenomenon, their perception of the associated dangers, and the identification of available resources (Gaillard 2010; U. Beck, Bernardi, and Latour 2008; Benjamin Wisner 2016) and as addressed in studies like those conducted around the Mediterranean region, such as (Cartier 2004; Pérouse De Montclos 2006; Fabiani and Theys 1987). This research aligns with the overarching objective, carried out following the earthquake that occurred on August 7, 2020, in the city of Mila. A post-seismic survey regarding seismic knowledge and behavior was conducted one week after this event, focusing on the residents of the "El Kherba" district.

2. Sympathetic Risk Culture.

Risk culture is a set of knowledge about the hazard, exposure, level of risk, and behaviors that enable individuals to cope with a potentially damaging event (Benitez, Reghezza-Zitt, and Meschinet de Richemond 2020). Risk culture represents a dynamic social construct influenced by individual and collective memories, personal experiences, preventive information, risk education, simulation exercises, and more. The interpretation of this concept fluctuates depending on the disciplines and the level of analysis, encompassing individuals, groups, communities, and territories. Scientists have long pointed out that a lack of a risk culture results in a deficiency of knowledge of the hazards and the undervaluation of risk, the loss of memory of events and ignorance of safeguard measures are major factors of vulnerability (Fabiani and Theys 1987; Thouret and D'ercole 1996; Cutter 2012; Blesius 2013; Ben Wisner and al. 2003; Gallopín 2006; Slovic 1987), preventive information, learning and preparation are presented as important tools to improve the resilience of populations living in vulnerable area (Weichselgartner and Kelman 2015). In the aftermath of natural disasters, public feedback highlights a correlation between this concept of 'risk culture' and the repeated occurrence of intense and potentially devastating physical phenomena from nature. Managers attribute these occurrences to the 'habituation to phenomena. This culture fosters the adoption of appropriate protective measures, such as adherence to guidelines and proactive preparedness, ultimately contributing to the resilience of communities. When referring to 'resilience,' it denotes the capacity to endure significant catastrophic events, minimize damages, self-organize during post-earthquake emergency phases, and undertake recovery efforts, encompassing both material and psychological reconstruction. Nevertheless, in Algeria, research on this risk culture is relatively limited (Cartier 2004) compared to studies addressing the physical vulnerability of buildings and hazard assessments (Bounemour and al. 2022; Mouloud and al. 2023; Mehdi Boukri and al. 2013).

3. The earthquake of August 07, 2020: a singular event.

As per the Center for Research in Astrophysical Astronomy and Geophysics (CRAAG) Algiers, an earthquake measuring 4.5 on the Richter scale occurred in Hamala, Mila, on Friday, August 7, 2020, at 12:13 p.m. The United States Geological Survey (USGS) reported a 4.9 magnitude earthquake in eastern Algeria on the same day at 7:15 a.m., followed by a 4.5 magnitude aftershock in the Mila province, located approximately 350 km (215 miles) east of the capital, Algiers. In this stage, the information provided by various sources leaves the population perplexed regarding the magnitude of the earthquake and its repercussions. This divergence of information contributes to increased uncertainty among residents, emphasizing the importance of clear and consistent communication during seismic crises. The Algerian Red Crescent reported that roughly 122 houses were affected, with three houses and a four-floor building being completely destroyed, and 31 apartments suffering partial damage. Other residences experienced significant structural damage, including visible cracks in walls, floors, and streets. Fortunately, there were no reported fatalities, only injuries. The earthquake inflicted severe damage on both structures and infrastructures in various parts of Mila, causing residents to flee in panic onto the streets. On the 16th of August 2020, the government declared the district of El Kherba in Mila a disaster area, home to more than 2,500 families. This declaration came after the date of the disaster (figures 1 and 2).



Figure 1. Situation of Mila and the kherba district (source: author).



Figure 2. The damages in the kherba district The population is unaware of the importance of geotechnical studies and the necessity to build on soils compliant with current regulations. (source: author).

4. Materials and Methods.

One week after the earthquake, a post-seismic survey was conducted among the residents of Mila. It is important to highlight that in Algeria, post-event feedback (RETEX) predominantly revolves around institutions, sometimes overlooking the broader population. This study targeted specifically the residents of the El Kherba neighborhood, adopting a multidimensional and interdisciplinary approach in line with the principles of post-crisis scientific RETEX. The main objective of this research was to extract human-centered insights to guide the development of preventive strategies with an enhanced emphasis on education. The sampling "Did You Feel It?" (DYFI) mapping system, developed and maintained by the United States Geological Survey, allows individuals who have experienced an earthquake to share their experience globally since 2004. The DYFI questionnaire primarily focuses on assessing the intensity of shaking, it also includes questions about the behavior adopted during the

seismic event. These questions provide additional important information for better understanding the behavioral response to earthquakes, such as perceived intensity, emotional reactions, and any observed on-site damages. The extent of participation in the DYFI questionnaire following the Ridgecrest earthquakes in California in July 2019 provides a robust database for analysis. This participation suggests that as intensity and fear increase, individuals tend to exhibit more active behavior, physically moving towards perceived safe locations. (Goltz and al. 2020) and was supplemented by insights from a study by (E. Beck and al. 2019), which examined perceptions of hazards, attitudes, and behaviors in response to such events. The sociological survey examines residents' representations of seismic risk, modes of communication and education, confidence in housing and institutions, individual mobility following tremors. The results identify the sources of knowledge for Mila's residents: earthquake experiences, official information from political institutions, informal information from families and neighbors, protective strategies and information during tremors, trust based on information sources and institutions, and demographic factors influencing vulnerability. The sample comprises 62 residents live in the Kherba district of Mila. To diversify the sample composition, the protocol required buildings of varying heights, limited participation to one voluntary individual per building, and allowed responses in Arabic or French. The data collected from the 62 responses offer a diverse range of educational backgrounds with more individuals holding degrees, and an age-related influence on education levels, particularly benefiting the younger population. However, specifying occupation and income remains challenging, and, most importantly, comparisons cannot be made due to the absence of a census. The survey includes residents from both large and small buildings but focuses on the most affected neighborhood in the city of Mila. It is characterized by an overrepresentation of men (daytime surveys; 18 women (29%) and 44 men (71%)). This sample appears to be as young as the average population, with 44 individuals under 35 years old (71%), 16 individuals aged 36-55 (25.80%), and 2 individuals over 60 (3.20%). This sample represents 8.50% of the population most affected by the earthquake."

5. Discussion and analysis.

Following the presentation of questionnaire results, this section will engage in a discussion and interpretation of these findings to illuminate the knowledge and perception of seismic risk among the population of Mila, and to extrapolate these insights to Algerian society.

5.1. Living with a hazard.

Regarding the perception of seismic risk among residents, the duration of their residence in a building demonstrates a significant role in shaping their seismic experience. Within the surveyed sample, 66% of individuals have resided in their current dwelling for over 20 years. This demonstrates a high level of residential stability, familiarity with the building, and integration into the local community. In El Kherba, residents similarly exhibit long-term residency experiences, with 66% (41 people) being over 20 years old and 34% (21 people) being under 20 years old. Among these residents, 85.5% are homeowners, and 14.5% are tenants, which further emphasizes the stability of residential arrangements, particularly due to family ownership of housing. Survey results also shed light on residents' earthquake awareness, with the question "Have you ever experienced an earthquake in the past?" garnering a 74.00% affirmative response. When considering the perception of seismic risk as a concept, it becomes apparent that it relies on more than just personal experiences; it also encompasses factors such as education, belief systems, and imagination. In the context of El Kherba, an interesting paradox emerges. Following the seismic event, 29% of individuals conjure up catastrophic scenarios, envisioning the potential destruction of the entire city in the future. Meanwhile, 11% believe such an outcome to be impossible, and a substantial 63% remain ambivalent, attributing the event's consequences to the will of a higher power. Interestingly, when describing the earthquake that occurred on August 7th, 60% of respondents deemed it to be strong, 27.5% characterized it as very strong, and 12.5% categorized it as moderate. This is notable given that the United States Geological Survey (USGS) estimated its magnitude at 4.5, with an intensity rating of IV (Figure 3). Strikingly, 43% of those surveyed perceived the earthquake at a higher intensity level of V, with 56.5% noting that they observed furniture moving during the event. According to (Mouloud et al., 2024), a level of intensity X was estimated taking into account the volume of soil resulting from landslides, rockfalls, along the El-Kherba and Cibari zones. The intensity level X was defined using the spatial distribution of damage and ground effects described for various locations such as Grareme-Gouga and Azzeba (Mila).

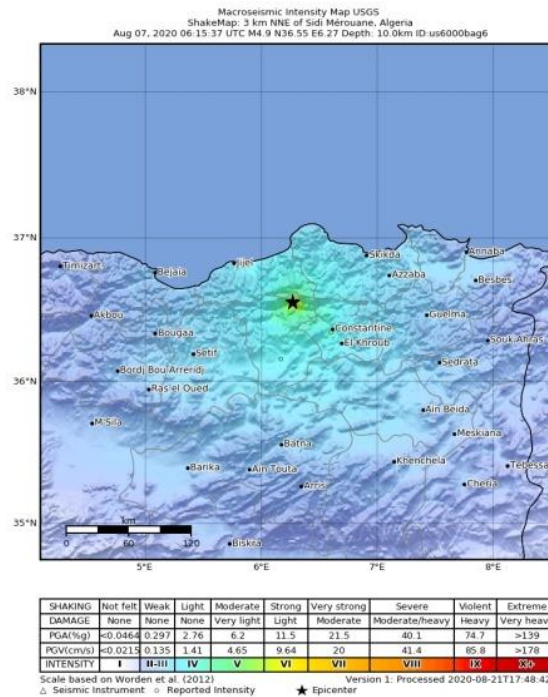


Figure 3. DYFI map created by USGS after the earthquake of August 07, 2020. (Macroseismic intensity map, source: USGS 2020).

5.2.Learning about risk.

Reflecting on the source and triggers of this earthquake allows for a contemplation of the potential for future seismic events and how to adapt to this ongoing threat. In the context of El Kherba, residents' interpretations of the earthquake's origin were as follows: 26.2% attributed it to tectonic factors, 32.8% professed a lack of understanding, while others pointed to the dam (21.3%) or the infiltration of water from the water tower (16.4%) as potential causes.. , The Kherba region experienced a remarkable landslide that caused damage to residences, and the earthquake on August 07, 2020 (Mw=4.9) was the triggering factor for the landslide(CGS 2020). Consequently, it becomes evident that the local knowledge of the site and geotechnical studies are often overlooked by the respondents (Figure 4).

According to you, what is the cause of the earthquake you felt?

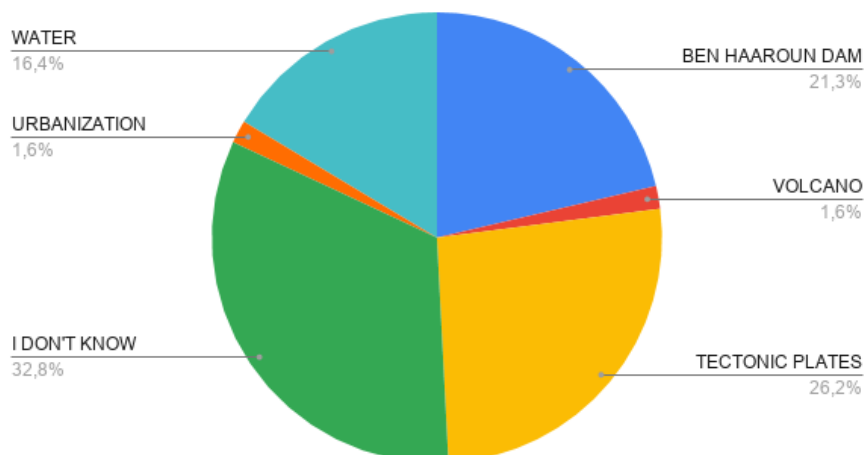
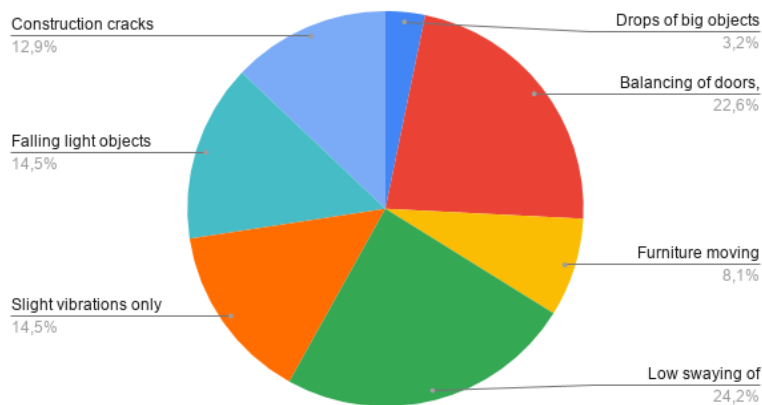


Figure 4. The cause of the earthquake (source: author).

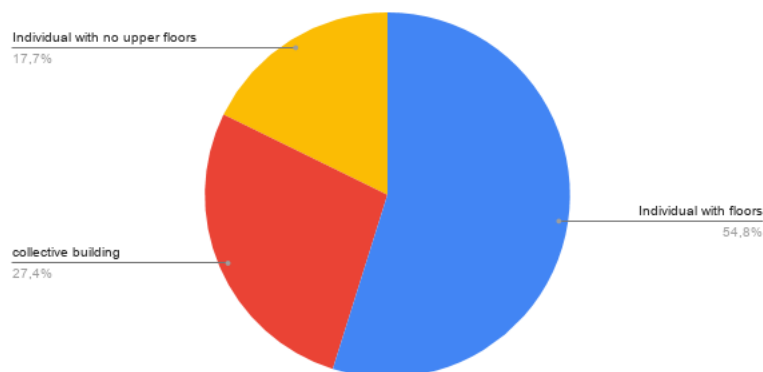
5.3. Perception of the earthquake and human behaviors during and immediately after the earthquake.

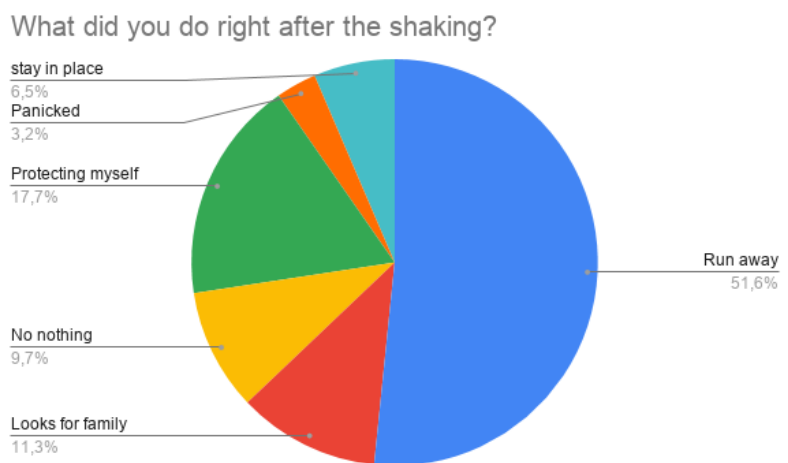
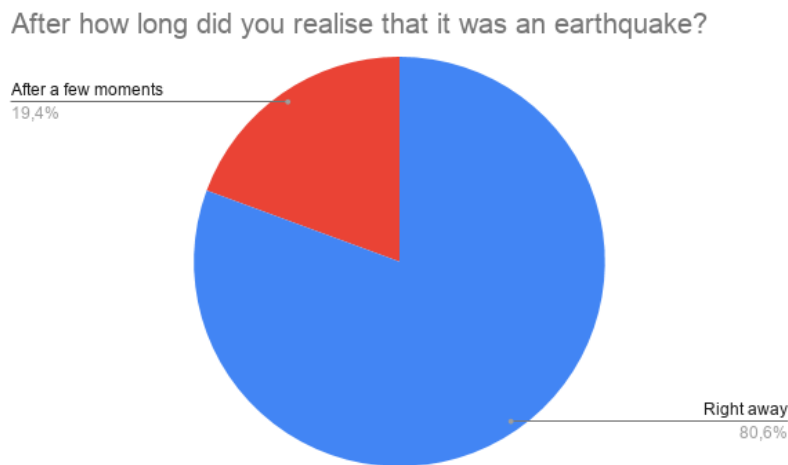
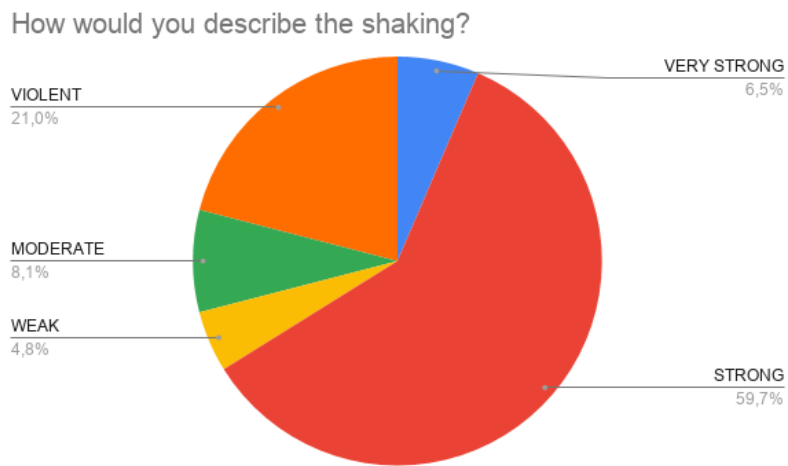
The intensity of the seismic shock encountered by residents significantly shapes their responses during earthquakes. In Kherba district, an impressive 80.6% of individuals immediately recognized the earthquake as it occurred, and 74.2% of those surveyed had previous experience with earthquakes. One week after the aftershock, 64.5% of the population still felt insecure. Regarding their perception of the earthquake's strength, 59.7% of respondents regarded the August 7th tremor as strong and very intense. The lack of awareness about protective measures amplifies vulnerability. When asked, "how to protect yourself during an earthquake," responses varied significantly. More than a third (39%) would seek refuge in open spaces outside, while 17.7% indicated they would take cover within a building, perhaps in a corner or under a load-bearing beam. In Kherba, over half of the residents expressed concerns about inadequate protection or a lack of knowledge about what to do. Nonetheless, personal experience seemed to influence their views on protection. Approximately 15.3% stated that they would remain in the building, perhaps praying or doing nothing, while 17.7% affirmed their intention to seek shelter inside (Figures 5).

Tick the most intense effect of the earthquake around you:



What type of building were you occupying at the time of the Quake?





Figures 5. Experience the shaking (source: author).

5.3.1. Seeking information and comprehension of seismic events.

Individual vulnerability is contingent on one's level of preparedness. Certain respondents believe they employ TV (48.4%) and specialized websites (72.6%) as tools for readiness and preventive measures. Meanwhile, others place their reliance on official institutions like governmental bodies, rescue teams, or scientists. A notable 12% express a desire to be prepared but have yet to take any concrete actions, with the remaining 88% admitting to inaction. In the context of Mila, 51.6% of the populace believe that the local authorities' handling of the seismic event on August 7, 2020, was inadequate.

Disseminating information beforehand and maintaining effective communication during a crisis serves to mitigate vulnerability. The surveyed individuals exhibit a preference for conventional information sources, with television being favored by 49% of respondents. In contrast, the internet is well-received by 73% of the survey participants as a vital tool for communication and information. Therefore, it becomes imperative for institutions to prepare localized information packages for the media. Historically, the media has primarily conveyed information that is more remote and catastrophic in nature. The information packages should encompass topics related to architecture, including structural integrity, vulnerability, and earthquake-resistant techniques, as well as instructions for adopting protective behaviors during seismic events. Tailoring the information to suit the target audience is crucial, and employing various media channels, such as newspapers, television, and the internet, as complementary means is essential. The institutions expected to be the primary sources of information include scientists, governmental bodies, and rescue teams.

5.3.2. Developing institutional confidence.

Trust in institutions plays a pivotal role in gauging the significance of provided information. Following aftershocks, individuals anticipate interventions from various entities, including the government, media, and scientists. However, few express confidence in governmental authorities to effectively manage seismic risks. The government is occasionally cited as a source of information, accounting for 20% of references. Notably, 52% of individuals in Mila assert that the crisis was managed poorly. Engaging the younger population in promoting a culture of risk awareness and preparedness is crucial.

The vulnerability indices for individuals indicate that the younger demographic is particularly susceptible. They acknowledge the seismic threat but don't perceive themselves as adequately protected. This observation aligns with previous studies that have highlighted how young people can be particularly vulnerable to natural disasters due to a combination of factors such as lack of experience, limited understanding of risks, and underdeveloped risk culture (Cutter and al. 2008; Smith and al. 2009). Their perception of vulnerability leans heavily towards external causality, encompassing notions of divine fate or natural phenomena. This perception is associated with a limited commitment to adopting protective measures and earthquake-resistant building practices. Knowledge is fragmented, with the influence of prior significant tremors and potentially misleading instructions. The population remains highly sensitive to seismic threats, often heightened by televised news and reports on overseas disasters. Traditional vulnerability factors, such as personal experience, gender, or the presence of children in the household, seem to exert minimal influence on risk perception within these sample groups. While individuals recognize the danger, they often lack a clear understanding of how to protect themselves and initiate appropriate measures. Overall, protective strategies are relatively underdeveloped, even though earthquake-resistant construction appears to be a viable solution. Doubts are prevalent regarding the safety of their own homes, coupled with skepticism about institutions' capacity to provide adequate information and assistance during crises. The urban layout raises concerns about safety due to population density and daily disorder. People are inclined to expect action from authorities but simultaneously express a lack of trust in their capabilities.

6. Conclusion.

It is therefore necessary to qualify discourses that generalize 'risk culture' on a territorial scale and directly link it to the culture of security that enables individual resilience. At a collective level, 'risk culture' must be contextualized based on the recurrence, nature, and intensity of events, territorial dynamics, or population heterogeneity. On an individual scale, translating 'risk culture' into resilience is a multifactorial and nonlinear process (Benitez, Reghezza-Zitt, and Meschinet de Richemond 2020). Inhabiting a territory exposed to seismic risk does not imply having 'habituation' to major events, let

alone catastrophes. The recurrence of hazards should be contextualized with the intensity of ensuing crises, individuals' perceptions, the actual damages suffered, and experiences lived. It's evident that regularly experiencing minor events skews the perception of major events and often leads to underestimating one's vulnerability and overestimating one's ability to cope with a major even. Enhancing the structural resilience of buildings and promoting individual earthquake preparedness hinges on the dissemination of both personal and collective seismic awareness. Nevertheless, in Algeria, there is a notable absence of spontaneously organized collective education initiatives in the realm of seismic safety following the August 7, 2020 earthquake. The assorted responses gathered from the residents of Mila provide a comprehensive overview of the diverse seismic perceptions and adaptive measures valued by the local populace. This survey furnishes valuable insights into how inhabitants perceive their own vulnerability to seismic events. The random questionnaire effectively captures the perspectives of those who experienced the earthquake. The subsequent analysis endeavors to establish an individual seismic vulnerability index, thereby establishing links between social characteristics and specific perceptions and adaptations. These characterizations spotlight unique vulnerabilities that can inform institutions in their efforts to tailor protection guidelines in alignment with the residents' comprehension. Broadly speaking, in Mila, the population appears genuinely concerned about the seismic threat, primarily based on their firsthand experience of tremors. However, they seem to be somewhat powerless when it comes to adjusting their behavior to mitigate these risks. Personal protective measures appear to be contingent on external factors beyond their immediate control, such as urban planning, adherence to earthquake-resistant building codes, and the perceived reliability of institutions. The reduction of individual vulnerability, which includes seeking information on seismic phenomena, appears to be intrinsically linked to a deeper understanding of these events. Given that the majorities of respondents are relatively young and have experienced recent seismic events, it is evident that their risk-awareness culture is underdeveloped, and they are actively seeking more information. However, there is a significant level of mistrust toward institutional sources of information, but this skepticism is mitigated by the aggregation of knowledge from various media outlets. This diversity in information sources results in a fragmented awareness of collective guidelines and, consequently, suboptimal behavioral adjustments. These findings underscore the importance of tailoring safety instructions to align with the specific characteristics of the population. The overarching challenge lies in adapting seismic protection measures to the real urban conditions and capacities of the residents. For example, gender and residential status appear to play some role but lack statistically significant influence: women exhibit slightly higher vulnerability than men, and homeowners seem to be more vulnerable. While these effects are somewhat limited in scope, they provide practical insights for institutions. The favorable reception of this academic survey by the local inhabitants underscores their genuine concern for their safety. Its success further demonstrates the collective eagerness to invest time in contemplation and reflects their confidence in finding solutions to mitigate the most unpredictable hazards. The ultimate challenge remains in engaging this diverse array of interests in a sustainable urban safety initiative.

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REFERENCES

1. Beck, Elise, Stéphane Cartier, Ludvina Colbeau-Justin, Carine Azzam, and Maud Saikali. 2019. 'Vulnerability to Earthquake of Beirut Residents (Lebanon): Perception, Knowledge, and Protection Strategies'. *Journal of Risk Research* 22 (11): 1391–1408. <https://doi.org/10.1080/13669877.2018.1466826>.
2. Beck, Ulrich, Laure Bernardi, and Bruno Latour. 2008. *La société du risque: sur la voie d'une autre modernité*. Champs. Paris: Flammarion.
3. Benitez, Fanny, Magali Reghezza-Zitt, and Nancy Meschinet de Richemond. 2020. 'Culture Du Risque Cyclonique et Résilience Individuelle En Guadeloupe et à Saint-Martin'. *EchoGéo*, no. 51 (April). <https://doi.org/10.4000/echogeo.18567>.
4. Blesius, Jean-Christophe. 2013. 'Discours Sur La Culture Du Risque, Entre Approches Négative et Positive. Vers Une Éducation Aux Risques?: Étude Comparée Du Québec et de La France'. *Géographie et Cultures*, no. 88 (December): 249–65. <https://doi.org/10.4000/gc.3141>.
5. Boukri, Mehdi, Mohammed Naboussi Farsi, Ahmed Mebarki, and Mohamed Belazougui. 2013. 'Development of an Integrated Approach for Algerian Building Seismic Damage Assessment'. *Structural Engineering and Mechanics* 47 (4): 471–93. <https://doi.org/10.12989/SEM.2013.47.4.471>.
6. Bounemour, Nadira, Riad Benzaid, Hassiba Kherrouba, and Souad Atoub. 2022. 'Landslides in Mila Town (Northeast Algeria): Causes and Consequences'. *Arabian Journal of Geosciences* 15 (8): 753. <https://doi.org/10.1007/s12517-022-09959-7>.
7. Cartier, Stéphane. 2004. 'Conditions Sociales de La Prévention Du Risque Sismique à Boumerdès'. Algérie, IRD, Sciences Au Sud. 2004.
8. CGS. 2020. 'SEISME DE MILA DU 07/08/2020 (Mw=4.9) Aspects Sismologique et Géotechnique'. Alger.
9. Cutter, Susan L. 2012. *Hazards Vulnerability and Environmental Justice*. Routledge.
10. Cutter, Susan L., Lindsey Barnes, Melissa Berry, Christopher Burton, Elijah Evans, Eric Tate, and Jennifer Webb. 2008. 'A Place-Based Model for Understanding Community Resilience to Natural Disasters'. *Global Environmental Change* 18 (4): 598–606. <https://doi.org/10.1016/j.gloenvcha.2008.07.013>.
11. Defosse, Stéphanie, Frédéric Leone, Clément Dompnier, Mélanie André, Jean-Philippe Chere, and Nicolas Taillefer. 2023. 'À l'épreuve du séisme du 11 novembre 2019 (Le Teil, France) : de l'impact au relèvement territorial'. *Géocarrefour* 97 (3). <https://doi.org/10.4000/geocarrefour.22168>.
12. Fabiani, Jean-Louis, and Jacques Theys, eds. 1987. *La Société Vulnérable: Évaluer et Maîtriser Les Risques*. Paris: Presses de l'École normale supérieure.
13. Gaillard, J.C. 2010. 'Vulnerability, Capacity and Resilience: Perspectives for Climate and Development Policy'. *Journal of International Development* 22 (2): 218–32. <https://doi.org/10.1002/jid.1675>.
14. Gallopín, Gilberto C. 2006. 'Linkages between Vulnerability, Resilience, and Adaptive Capacity'. *Global Environmental Change* 16 (3): 293–303. <https://doi.org/10.1016/j.gloenvcha.2006.02.004>.
15. Goltz, James D, Hyejeong Park, Genta Nakano, and Katsuya Yamori. 2020. 'Earthquake Ground Motion and Human Behavior: Using DYFI Data to Assess Behavioral Response to Earthquakes'. *Earthquake Spectra* 36 (3): 1231–53. <https://doi.org/10.1177/8755293019899958>.
16. Mouloud, Hamidatou, Amar Chaker, Hallal Nassim, Saad Lebdioui, Hugo Rodrigues, and Matthew R. Agius. 2023. 'Post-Earthquake Damage Classification and Assessment: Case Study of the Residential Buildings after the Mw = 5 Earthquake in Mila City, Northeast Algeria on August 7, 2020'. *Bulletin of Earthquake Engineering* 21 (2): 849–91. <https://doi.org/10.1007/s10518-022-01568-9>.
17. Pérouse De Montclos, Marc-Antoine. 2006. 'De l'impartialité Des Humanitaires et de Leur Perception Par Les Bénéficiaires : Les Enjeux Politiques de l'aide Internationale Au Burundi:'. *Autrepart* n° 39 (3): 39–57. <https://doi.org/10.3917/autr.039.0039>.
18. Slovic, Paul. 1987. 'Perception of Risk'. *Science* 236 (4799): 280–85. <https://doi.org/10.1126/science.3563507>.
19. Smith, Susan M., Mary Jane Tremethick, Peggy Johnson, and June Gorski. 2009. 'Disaster Planning and Response: Considering the Needs of the Frail Elderly'. *International Journal of Emergency Management* 6 (1): 1–13.
20. Thouret, Jean-Claude, and Robert D'ercole. 1996. 'Vulnérabilité Aux Risques Naturels En Milieu Urbain: Effets, Facteurs et Réponses Sociales'. *Cahiers Des Sciences Humaines. ORSTOM* 32 (2): 407–22.
21. Weichselgartner, Juergen, and Ilan Kelman. 2015. 'Geographies of Resilience: Challenges and Opportunities of a Descriptive Concept'. *Progress in Human Geography* 39 (3): 249–67. <https://doi.org/10.1177/0309132513518834>.
22. Wisner, Ben, Piers Blaikie, Terry Cannon, and Ian Davis. 2003. *At Risk: Natural Hazards, People's Vulnerability and Disasters*. 2nd edition. London; New York: Routledge.
23. Wisner, Benjamin. 2016. 'Vulnerability as Concept, Model, Metric, and Tool'. In *Oxford Research Encyclopedia of Natural Hazard Science*, by Benjamin Wisner. Oxford University Press. <https://doi.org/10.1093/acrefore/9780199389407.013.25>.