ANNALS OF GEOPHYSICS, 59, FAST TRACK 5, 2016; DOI: 10.4401/AG-7263

The 2016 Amatrice seismic sequence in the Media

GEMMA MUSACCHIO[1]* AND GIOVANNA L. PIANGIAMORE[2]

[1] Istituto Nazionale di Geofisica e Vulcanologia, INGV - AC,

[2] Istituto Nazionale di Geofisica e Vulcanologia, INGV, Sezione Roma 2, Sede di Portovenere, Fezzano di Portovenere (SP)

*gemma.musacchio@ingv.it

Abstract

Media's power in setting the public's agenda for discussion can affect perception and debate upon disasters. In the frame of a dialogical approach of science communication, here we challenge the paradigm for which those issues that experts consider valuable are not in the Media's agenda. We have studied the way newspapers have addressed the Amatrice 2016 sequence and discussed the story telling. We have analyzed specific indicators to assess to what extent the scientific coverage, risk reduction and damage issues are discussed.

First results show that science is in the Media when framing - encoding with meaning- news on a natural disaster. The Media do think valuable to provide public with an in-depth scientific coverage of an earthquake and refer to authoritative sources. As time goes by and aftershocks Magnitude decreases, a more reflexive thinking is triggered; than news stories include more risk reduction indicators than damage. Although memory of past earthquakes is always part of the story, only one month after the main shock risk reduction disappears from the Media's agenda.

We also explored the level of public engagement in risk reduction and found out that, as far as it concern newspapers, Media still seem not believe that citizens should be active part of the debate upon their own safety.

I. INTRODUCTION

News stories on natural disasters attract a great audience interest for which the Media represent among the most important sources of information (Pasquarè and Pozzetti, 2007; Colombo et al., 2002; Fischer, 1994). They perfectly meet Media newsworthiness criteria such as human interest, proximity, possible future impact, oddity and timeliness elements.

By channeling information in a way that makes some aspects more relevant than others (Forsyth, 2003) the Media introduce frames of reference (Gilliam and Bales, 2001) that influence how different individuals or societies perceive disasters.

On the other hand the knowledge and understanding of what the Media grant be relevant for their public, is nowadays fundamental for scientific institution specifically dealing with natural hazards. Here we test whether the paradigm, upon which journalists often avoid

providing in-depth scientific coverage on natural causes of extreme geological events and hardly ever highlight the need to prevent and mitigate their consequences, holds, and if yes to what extent. To pursue our target we have studied the way the Media have tackled a recent earthquake while the emergency phase was still on going.

On August 24th, 2016 (1:36 UTC) a Mw6.0 earthquake struck an area in the Central Apennines (Italy) between the municipalities of Norcia and Amatrice. A large aftershock, Mw 5.3, occurred about one hour later (2:33 UTC) and, in the first month, more than 15 earthquakes with Magnitude larger than 4.0 followed the main shock (Gruppo di Lavoro INGV, 2016).
Although belonging to a high hazard zone, the quake found population widely unprepared and damage was extensive (Gruppo di Lavoro INGV, 2016). The earthquake's news has spread in the Internet, reaching 200 thousands tweets a few hours after the main shock.

We have analyzed the echoes of the seismic sequence in the Media, mostly focusing on those issues that if were on the Media's agenda they might trigger a change in attitude and in perception of seismic risk. More specifically we have studied to what extent the issues regarding the natural phenomena, those concerning risk and damage were addressed. The rationale behind our approach is that by not properly understanding the difference between hazard and risk laypeople do not have a proper and effective attitude towards disaster reduction.

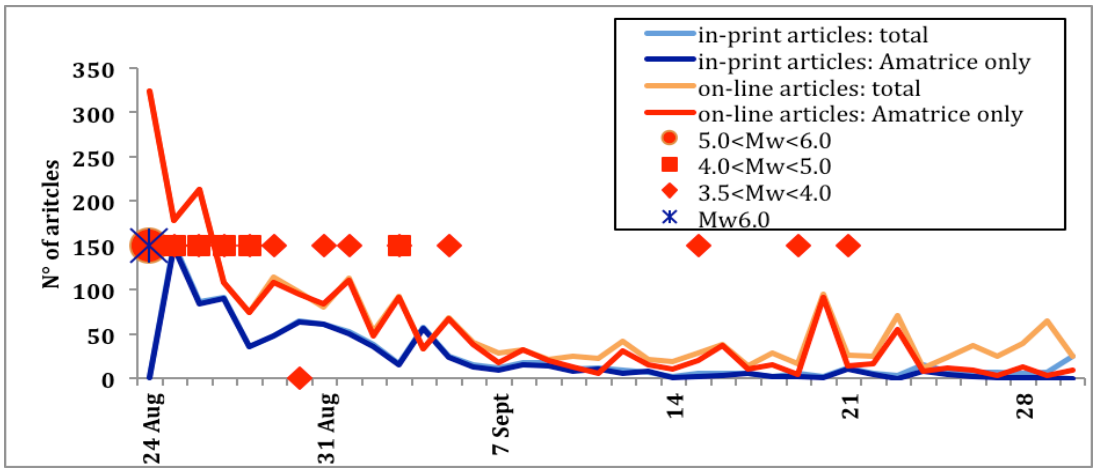


Figure. 1. *Impact of the Amatrice sequence in the Media: number of printed and on-line news stories talking about the sequence in one month. The distribution of the M>3.5 earthquakes over time is plotted for comparison.*

II. Method

This paper uses a quantitative approach to explore the impact that the 2016 Amatrice seismic sequence had on the Media. News stories were retrieved from articles published within the first month after the main shock by in print and online newspapers included in the INGV press review (Fig. 1). The sample includes news stories from 355 in print and 653 online newspapers and refers to 9 selected days with the on-going seismic sequence. The sampling on days was less tight as the sequence smoothed down.
Because we are interested on what the press considers be newsworthiness we deliberately have not chosen a software-based automated search of keywords to explore the stories. We rather relied on a in-depth assessment: we

read thoroughly each story and evaluated each indicator upon consistency. For the online news we explored only titles and assessed just the highlights that journalists think worth of notice. The approach relies on the fact that in print newspapers are addressed to readers who like to take their time to read, while online are for those who might just be caught by the title of news. Online newspapers are bound to have sharp and right-to-the-point titles that should highlight in a few words what the journalist thinks worthwhile.

We consider newspaper type (specialist, generalist, local, national and international), if the article is signed as a stuff product or with the name of the journalist, whether is on a first page (only for printed). We then set indicators to explore WHO does the journalist refers to (the source), WHAT is considered to be newsworthiness and who is actually the journalist trying to give VOICE to.

For each specific indicator we measure how many stories were published by the Media.
In assessing newsworthiness we break down the WHAT to three main categories of indicators, which we think of major interest to understand the image of a natural disaster in the

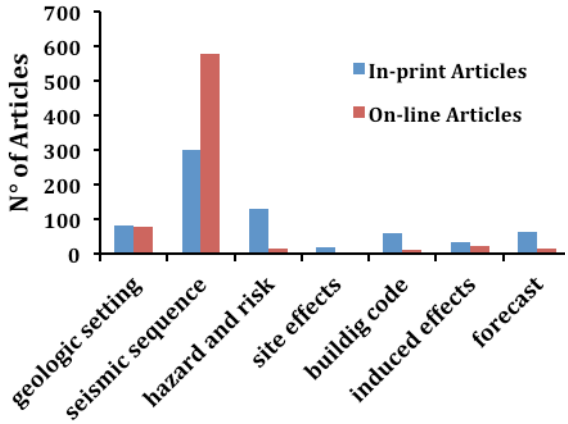
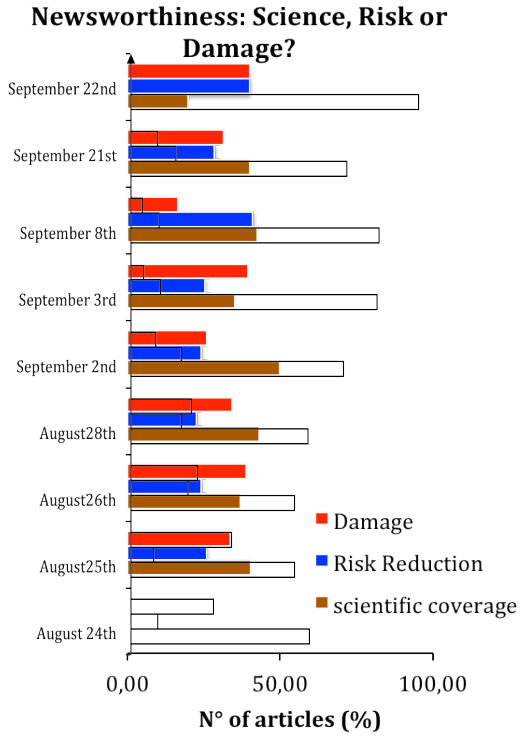


Figure 2. The *WHAT in the Media: assessing the in-depth scientific coverage.*

Media in the first days of its occurrence. They are: *Scientific Coverage*, *risk reduction* issues and *earthquake damage*.

To assess *Scientific Coverage* (Fig. 2) we consider how frequently journalists cover topics such as: the geologic setting of the area, the seismic sequence and surface seismic-induced effects (es. landslides, surface rupture), hazard or risk maps, site effects, building code or forecast. Risk Reduction issues are analyzed distinguishing prevention/preparedness concepts from post earthquake interventions or investigations of responsibilities. We have also counted if *Risk Reduction* was not mentioned at all. When considering *Earthquake Damage* we assessed whether the article reported on damage, collapse, deaths, and loss of money or whether the damage was related to public buildings (e.g. schools).

Figure 3. *The newsworthiness along time is shown. Black contour empty bars are online newspapers. Scientific coverage always plays a major role. Damage is more discussed than risk reduction in the first days of the sequence. However, later on (i.e. September 2nd), online titles begun to show risk reduction issues more frequently than damage. They follow the decrease in Magnitudes of aftershocks.*



The VOICE indicators allow highlight whether the journalist is speaking for citizens, politicians, or scientists. It is the most difficult to assess and its study might be not truly objective. For this reasons we have included the not-defined/journalist all those cases when doubts might arise.

III. Results

Although this is an on-going study that will include the whole world press, newscast and social, some preliminary observation can be retrieved.

The earthquake had a strong echo in the Media and almost the entire press review was filled with stories on the Amatrice sequence (Fig. 1). However, as one would expect, the Media's attention curve follows the one of aftershock and Magnitude distribution in time, and a few days after the main shock the number of news stories dropped significantly.

We discuss here the analysis that concerns the WHAT and the VOICES.

Scientific Coverage

Result on *Scientific Coverage* (Fig. 3) is somewhat surprising: more than 60% of the stories included one of the indicators we have chosen to explore (Fig. 2). Previous study that considered the 2002 Molise earthquake have shown that no more than 22% of the stories had mentionany scientific issue (Pasquarè and Pozzetti, 2007). Moreover, in that study no more than 11% had dealt with seismic classification and mapping while here we found a percentage never less than 20%.

Damage and Risk

Until a few days after the main shock (Fig. 3), damage, including causalities, is considered to be more valuable to give attention than risk reduction issues. Interestingly, risk reduction becomes a hot topic and titles of articles includes more often risk reduction than damage indicators, later on when events decrease in Magnitude and number. This can point out that as the emergency cool down a more reflexive thinking shows up. However one month after the main shock and as the aftershocks magnitude drops on-line titles do not have indicators for damage or risk anymore.

They are discussed only inside the in-print articles.

If we look at specific issues concerning risk over time (Fig. 4), we can see that Media have well in their agenda the memory of past earthquakes. Although not included in the titles, up to 60% percent of the stories refers to past earthquake and recall that the Amatrice sequence occurred in an area with high seismicity. Another aspect worth to notice is that prevention is actually discussed generally more than post-earthquake and/or emergency related actions.

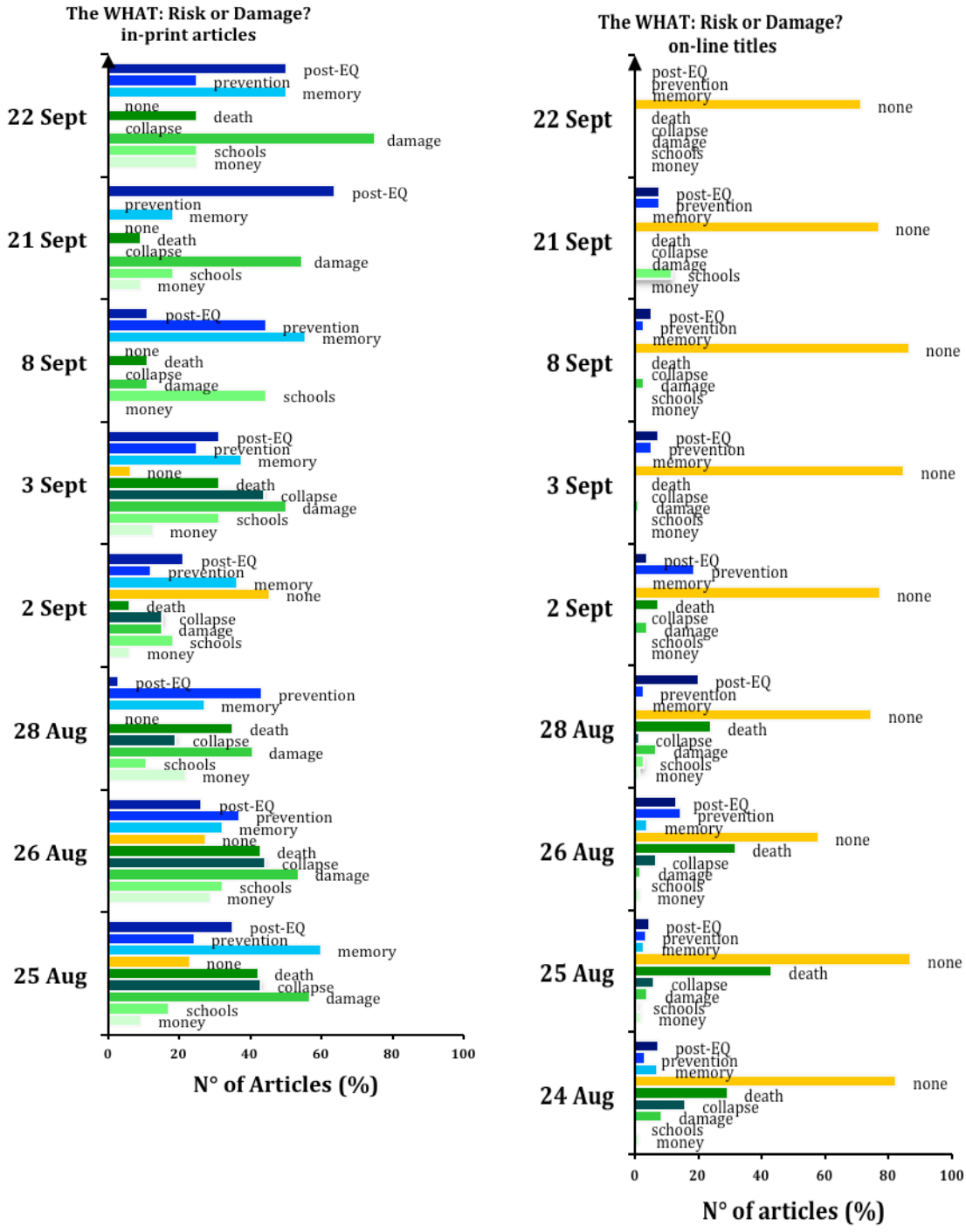


Figure 4. *Risk reduction and damage indicators versus time. The memory of past earthquakes is always present.*

Voices

We are aware that our analysis is based on a press review from a scientific institution. However giving a first look to international press we have found that news stories concerning the Amatrice sequence always refers to a scientific source. If our study holds, than the results concerning the VOICES indicator, which sets science on a highlight, are in agreement with the fact that in Italy only 51% of people acknowledge that we should ask scientist to get answers concerning science (Observa 2011). Scientists seems not be trivially trustworthy.

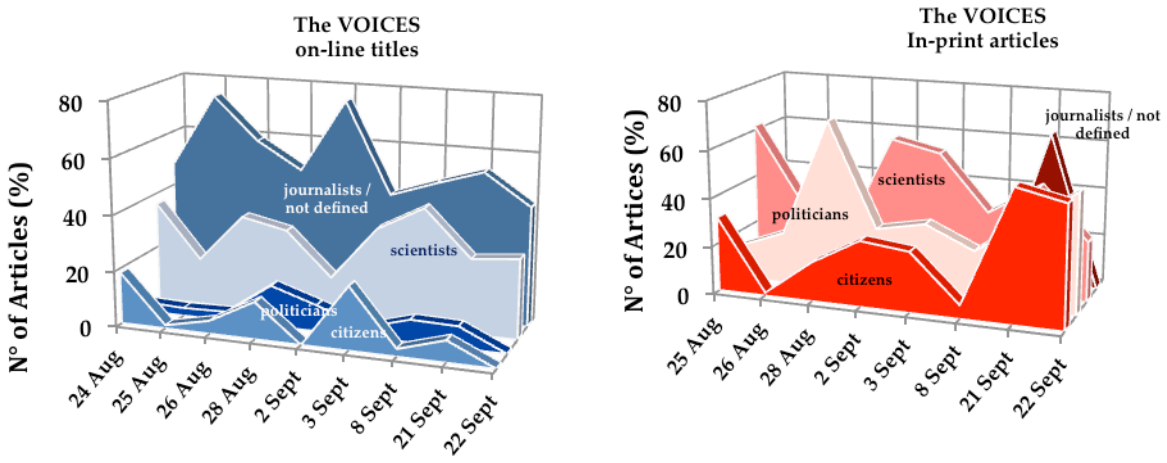


Figure 5. *Who is really speaking? The VOICES indicators acknowledge scientists or experts as the real speaker in 51% of the stories. Citizen are the most unspoken voices*

Citizen has a very shy VOICE that does not come out in the first days after the disaster. It takes several days to have them start speaking up in the newspapers (Fig. 5). This is surprising if we consider that they are the first victims of disasters and might be the key to work on for future risk reduction plans. Public engagement in science and risk communication and a better involvement of local communities in the discussing on safety can be the way for the future.

IV. CONCLUSIVE REMARKS

Media are interested to newsworthiness; politicians want to make sure they can gain votes; scientists might focus in public understanding of science. When it comes to risk communication, citizens live inside this triangle of interests; yet they are main actors in a public's agenda that is set by the Media. In this frame the understanding of what the Media might acknowledge newsworthiness is fundamental to help scientists to deliver those concepts that can trigger awareness on hazard, risk and safety. Risk communication is a social responsibility that can efficiently be accomplished with cooperation between scientists, experts, and journalists (Fjæstad, 2007). Informed and aware citizen can than take actions towards politics and policy makers.

Citizens, without the Media's involvement, might not easily have access to hazard-related issues and might not be able to bring them to the attention of decision makers (Colombo et al., 2002). The scientific community might play

a key role in this process, trying to establish tighter connections with the Media and the general public (Pasquarè and Oppizzi, 2012).

Here we observe as the relevance of the scientific coverage has improved over time and, from the 2002 Saint Giuliano Earthquake till the Amatrice 2016 sequence, the Media write 40% more of stories dealing with it. Fourteen years later, many more natural disasters, including earthquakes, have occurred, which we should study the impact in the media. One can argue that this study points out that science now meets newsworthiness criteria also thanks to what scientists have done in quiescence time, when reflexive thinking is encouraged.

Nonetheless if science was in the agenda of general stakeholders risk reduction was not there. Memory of past earthquakes can be envisaged as one of those parameters that should trigger actions towards risk reduction. We notice that whereas memory is well in the Media, risk reduction issues do not seem to deserve being in their agenda.

ACKNOWLEDGEMENTS

We thank the journal's unknown reviewer for the interesting comments. We are also grateful to suggestions by Francesca Noceti (University of Ferrara). This work is the thesis for master graduation in Scientific Journalism and Science Communication at the University of Ferrara.

REFERENCES

[Björn Fjæstad, 2007] Fjæstad, B. (2007). Why journalists report science as they do. In Bauer, M. and Bucchi, M. Journalism, Science and Society. Science communication between News and Public Relations. Routledge, New York: 123-131.

[Colombo et al., 2002] Colombo, A., Herva´ s, J., Vetere Arellano, A. L. (2002). Guidelines on flash flood prevention and mitigation. European Commission Joint Research Centre Institute for the Protection and Security of the Citizen, Technological and Economic Risk Management. Natural Risk Sector, Ispra, Italy.

[Fischer, 1994] Fischer III, H. W. (1994). Response to Disaster: Fact Versus Fiction and its Perpetuation. The Sociology of Disaster. New York University Press of America.

[Forsyth, 2003] Forsyth, T. (2003). Critical Political Ecology: The Politics of Environmental Science. Routledge, New York.

[Gilliam and Bales, 2001] Gilliam, F.D. and Bales, S.N. (2001). Strategic Frame Analysis: Reframing America's Youth. Social Policy Report, 15 (3) http://repositories.cdlib.org/ccc/chidren/005S

[Gruppo di Lavoro INGV, 2016] Gruppo di Lavoro INGV sul terremoto di Amatrice (2016). Secondo rapporto di sintesi sul terremoto di Amatrice Ml 6.0 del 24 Agosto 2016 (Italia Cantrale), doi: 10.5281/zenodo.154400.

[Pasquare and Pozzetti, 2007] Pasquare, F. and Pozzetti, M. (2007). Geological hazards, disasters and the media: The Italian case study. Quaternary International 173–174: 166–171.

[Pasquare and Oppizzi, 2012] Pasquare, F. and Oppizzi P. (2012). How do the media affect public perception of climate change and geohazards? An Italian case study. Global and Planetary Change 90–91: 152–157.