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How Development Affects News Media Coverage of Earthquakes: Implications for Disaster Risk Reduction in Observing Communities

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Abstract: Previous research suggests that lesson-drawing news coverage of disasters can create windows of opportunity for policy learning in the observing communities. This is especially important for cities facing similar vulnerabilities to disaster-affected communities, where they can learn from their events to pursue disaster risk reduction policies to mitigate against those risks at home. However, little is known about the conditions under which newspapers in at-risk communities provide the type of news coverage necessary for policy learning. Using logistic regression to analyze an original dataset produced from a content analysis of five newspapers' coverage of five earthquakes, we demonstrate that the level of development of the disaster-stricken community systematically influences the nature of news coverage in at-risk communities. These results have important implications for the understanding of urban disaster risk reduction, suggesting that the conditions for bottom-up policy learning are more likely to occur following disasters in wealthier countries.

Keywords: disaster risk reduction; development; news coverage and reporting; content analysis; logistic regression; earthquakes; newspapers; international communication

1. Introduction

Disasters are rare events that have significant effects on affected communities. Previous research suggests that lesson-drawing news coverage of disasters can create windows of opportunity for policy learning in observing communities [1–5]. Furthermore, recent research demonstrates that coverage that emphasizes similarities between communities can lead to changes in the public's attitudes and intentions to pursue public policy in response to reports of overseas disasters [6–8]. However, less is known about the determinants of the types of news coverage necessary for policy learning. In this paper, we seek to understand the conditions under which news outlets draw lessons from the disasters experienced by distant communities.

This is particularly important because most people do not experience disasters first-hand, but instead rely on mediated depictions of distant events. The news media set the terms for debate over distant disasters, building narratives about disaster risk through their interpretation of those events for local audiences. We define this process as localization: The practice of interpreting and reporting distant events by relating them to their local audience. While domestication involves translating foreign events for national audiences [9–11], localization focuses on subnational interpretation and production of news in response to foreign events. Although some scholars treat domestication and localization as synonyms, we argue that they are distinct concepts.

In this paper, we report results from an original dataset constructed from a stratified sample of newspaper coverage of five distant earthquakes. The results demonstrate that the level of development of the disaster-stricken community affects the nature of coverage in at-risk communities. As the level of development of the affected community increases, the news coverage is more likely to emphasize similarities and less likely to emphasize differences between communities.

These results have important implications for the understanding of news coverage of disasters, providing systematic evidence about when journalists will emphasize similarities or differences between communities. Given recent evidence about the effects of similarity-based news coverage of distant disasters on public demands for disaster risk reduction policies [7], this study has significant implications for the understanding of urban disaster risk reduction in observing communities.

2. Literature Review

Journalists, editors, and organizations consciously produce the news as the product of economic incentives to achieve and sustain an audience. News outlets decide which events are worthy of their attention, how to devote their scarce resources to cover the events, and how they interpret the events for their target audience. Previous scholarship on international news flows demonstrates systematic patterns of foreign news coverage, where factors such as the status of a country [12–15]; economic development [16–18]; geographical proximity [16,19,20]; the presence of troops [16]; population size [19]; international trade [21–23]; and news agency accessibility [21] influence the spread of information from newsworthy events to more distant communities. While this literature explains the frequency and distribution of foreign news, it offers less insight into how local news organizations cover foreign events [24].

However, an emergent research agenda attempts to better understand the production of local news in response to distant international events, leading to different conceptions about how this process works [23]. On the one hand, proponents of globalization posit that the production of news is similar across the world [25,26], primarily because of improved technology [27,28]; professional training and journalistic norms [9,29]; the worldwide presence and widespread use of press agencies such as Reuters and Associated Press [10]; and the convergence of different media organizations [30] account for homogenous news coverage. In short, this approach suggests that fiscal and professional incentives lead to similar interpretations of events across the world.

On the other hand, proponents of domestication posit that news organizations interpret distant events through their own distinct lens [9,10,31,32]. While the same events might be reported, news outlets diverge in how they make sense of these events for their audience. For example, previous research demonstrates that news coverage of foreign events is contingent on their emotional attachment to events [31]; the prospect of social unrest [31]; shared interests and values with the country [33]; national identity [34]; and the extent to which the domestic audience identifies with the overseas community [35]. Domestication essentially argues that domestic news organizations cover international events differently based on the specific national context in which they operate. However, domestication scholarship largely focuses on the national level—it offers little guidance about how local news organizations cover foreign events.

Local news interpretation of international events is almost synonymous with translation, where news outlets interpret these events for local audiences [36–41]. This localization process helps explain the variation in coverage of distant events in local news [24], largely due to the fact that local news faces especially large imperatives to make content relevant for their local audiences [42,43]. Furthermore, distant events might be a catalyst for discussions of common experiences between communities [44]. In this paper, we delve into this process further to determine how development influences the news coverage of distant earthquakes, and how this might alter the conditions for disaster risk reduction in these communities.

2.1. Taxonomy of Localization

Recent research introduced a taxonomy of localization, which can be used to measure the nature of news coverage of distant events [7]. The taxonomy identified three types of localization: Communalization, neutral localization, and othering. In many ways, the taxonomy builds on the modes of domestication identified in previous research on news coverage of climate [35]. However, the taxonomy of localization has some specific features that have implications for understanding how news coverage of distant disasters can set the agenda for disaster risk reduction.

Table 1 summarizes the taxonomy of localization and indicators of each type of localization within the three-part taxonomy. Further details about the taxonomy are provided in Appendix B.

Table 1. A taxonomy of localization in the news coverage of overseas events.

Type of Localization	Indicators
Communalization	• How the event offers lessons for the local community • Direct comparisons between communities • Descriptions of shared characteristics between communities
Neutral localization	• Non-policy related implications for the community • Citizens of the newspaper's community in the affected community • Links to affected community through diaspora population • Historical experiences of local people in the affected community
Othering	• Explicit attention drawn to differences between communities • Reference to characteristics of the affected community not shared by the newspaper's community • Appeals for help that could establish a victim-savior relationship between communities

Source: [7].

First, communalization refers to news coverage which emphasizes the similarities between communities. This can involve making explicit connections between the vulnerabilities faced by each community, and drawing lessons from the disaster for the news organization's local community. This type of coverage is identifiable through direct connections made between the disaster-stricken community and the news organization's community, which could also lead to an increased affinity between the two communities. Communalization is a logical translation of distant events to make them appear meaningful and relevant for the news outlet's local audience. Previous research demonstrates that communalization can have positive effects on public action in support of public policy in the news outlet's community [7].

Second, neutral localization refers to superficial connections made by the local news organization to distant events. This type of coverage interprets the distant event in ways that are meaningful for their local audience, including references to specific people affected by the event and the implications for the news outlet's economy. However, this type of coverage is unlikely to lead to any specific policy learning opportunities in the observing community.

Third, othering refers to news coverage that emphasizes differences between communities. Othering implicitly and/or explicitly attaches blame for the disaster to the afflicted community for alleged moral, economic, social, cultural, or political failures [45–47]. Othering involves references to exceptional or different characteristics of the disaster-affected community that are linked to the scale of the disaster, which differentiates that community from the local news audience.

For example, othering can occur in well-intentioned appeals for funds to support victims of the disaster by implying the observing community faces a burden of responsibility to provide for the victims. This form of othering could emphasize power imbalances through the cultivation of pity for the recipient state, reinforcing differences between communities [48].

A more explicit way of othering the distant community involves discussions of the factors that allegedly contributed to the scale of the disaster, including corruption, poverty, poor governance,

inadequate preparedness, social disorder, criticism of the response, cultural difference, the treatment of women, and the troubled history of a country.

In comparison to the other two types of localization, othering is often more subtle and difficult to detect, but it can have important implications for the prospect of disaster risk reduction in observing communities as the perception of 'otherness' of the disaster-affected community can prevent lessons from being learned in other communities.

To provide some additional insight into what each form of localization looks like in practice, Figure 1 provides some examples of each type of news coverage of earthquakes.

Figure 1. Examples of communalization, neutral localization, and othering (**left** to **right**). Sources: [49–51].

Communalization is evident in the *Dominion Post* coverage of the 2011 Tōhoku earthquake and tsunami on the left of the figure. That article appeared on the front page of the paper, indicating how the earthquake and tsunami could occur in Wellington and specifically outlining vulnerable coastal communities.

Neutral localization features in the central article, where the *Gleaner* in Jamaica discusses the experiences of a Chilean-Jamaican couple in the 2010 Chilean earthquake. As evident in this article, these are typically human interest stories that are relevant for the local audience, but they are unlikely to lead to discussions of disaster risk reduction.

Finally, othering is demonstrated in the editorial on the right from the *Vancouver Sun*, which pleads for their local community to provide aid to the victims of the Pakistan temblor. Instead of emphasizing similarities and drawing lessons from the disaster, the editorial suggests that the burden of responsibility for saving lives is on their local community. While this editorial is well-intentioned, it implicitly creates a victim-savior relationship between the local community and the disaster-stricken country.

2.2. Development and Localization

Previous research suggested there was a clear but imperfect relationship between development and the nature of coverage of overseas earthquakes [7]. While indicators of communalization were more frequent after earthquakes in developed countries such as Chile and Japan, this was an imperfectly distributed pattern. On the other hand, othering occurred far more frequently in the stories on Pakistan and Haiti. These patterns suggested that news coverage of the earthquakes depended on the level of development of the stricken country.

However, this previous analysis used sampling methods and data collection that are insufficient for causal tests of a relationship between development and the nature of news coverage. First, the sample was not a probability sample, meaning that no generalizations can be made from the sample to the wider universe of all coverage. Second, the content analysis utilized the practice of "memoing" to

identify trends in the data through a close reading of the articles [52]. In short, the analysis was not replicable, the data was not appropriate for causal inference, and so no plausible claims could be made about the relationship between development and news coverage of disasters.

To address these limitations, this study tests the relationship between development and the likelihood of communalization and othering in the coverage of distant disasters. We expected that development would play a critical role in influencing the nature of coverage of distant earthquakes. First, we expected that as the stricken community's development increases, the likelihood of communalization increases. This is because news outlets in observing communities are more likely to identify with communities that are developed, making it more likely newspapers would compare themselves to the communities suffering through the disaster. The effect of development should be reflected in the probability of a paragraph featuring communalization.

At the same time, development is likely to have a negative effect on the likelihood of othering. If there are other factors that might influence the damage caused by an earthquake, including but not limited to poor building standards, corruption, poverty, or poor government, this is likely to influence the coverage of distant earthquakes. Where these mitigating factors contribute to the scale of the disaster, the blame for the catastrophe is more likely to be placed by news organizations on the stricken community, and differences between communities are more likely to be emphasized when the community is poor. As a result, one should expect that development has a negative effect on the probability of a paragraph featuring othering. Accordingly, the hypotheses are:

H1. *SC Development Communalization Hypothesis: As stricken community development increases, the probability of communalization increases.*

H2. *SC Development Othering Hypothesis: As stricken community development increases, the probability of othering decreases.*

3. Materials and Methods

To better understand the determinants of localization, we tested the determinants of communalization and othering in the news coverage of five distant earthquakes. Using a replicable coding scheme built upon Jamieson and Van Belle's taxonomy, we paid two graduate student coders to code data from a stratified sample of news articles in the *Dominion Post, El Comercio, Hindustan Times, Manila Times*, and the *Kingston Gleaner*, covering earthquakes in Chile, Haiti, Japan, New Zealand, and Pakistan. This data is useful to conduct tests of the relationships between development and the news coverage of overseas earthquakes, providing an improved understanding of the distribution of communalization and othering in the news coverage of overseas disasters through a representative sample of articles.

To test the theory of development and localization, we collected and coded a new sample of articles from five newspapers about five different earthquakes. In an important improvement on prior research, we developed a sample that is much more representative of the entire universe of coverage for each newspaper and earthquake. This sample improves our ability to make generalizable claims about the coverage of distant earthquakes in these newspapers, and we can test the causes of different types of coverage.

We took a stratified sample of up to 20 articles for five newspaper-earthquake combinations. The sampling strategy and methods are available to view in Appendix A. Unfortunately, not all earthquakes generated 20 articles for each newspaper, and we finished with 321 articles in the sample, which contributed 3501 paragraphs in total.

In chronological order, the earthquakes in the sample were the 2005 Kashmir earthquake in Pakistan, the 2010 Haiti earthquake, the 2010 Chilean earthquake, the 2011 earthquake in Christchurch, New Zealand, and the 2011 Tōhoku earthquake and tsunami in Japan. Table 2 presents a summary of the damage caused by the earthquakes, presented in descending order by the level of development of the stricken country. The earthquakes caused significant damage to affected areas and produced

a considerable number of fatalities. Together, they constitute the majority of the most damaging earthquakes prior to 2012 [53].

Table 2. The damage caused by the earthquakes.

Stricken Country	Date of Earthquake	Magnitude of Earthquake on Richter Scale	Number Killed	Estimated Damage ($US Million)
New Zealand	22 February 2011	6.1	181	150,000
Japan	11 March 2011	9.0	19,846	210,000
Chile	27 February 2010	8.8	562	30,000
Pakistan	8 October 2005	7.6	73,338	5200
Haiti	12 January 2010	7.0	222,570	8000

Source: [53].

We first identified observing communities that would be appropriate for the analysis. The countries of India, Jamaica, Peru, New Zealand, and the Philippines were chosen because they are mirror communities for the affected countries due to their cultural, economic, geographical, and geological similarities with the affected countries, with New Zealand being both an affected and an observing country in our analysis.

Figure 2 shows the geographical range of our sample, with mirror communities serving as near neighbors to one affected community, but distant from the other earthquakes. Figure 3 presents the location of the affected community (Canterbury) and the observing community (Wellington) in the within-country comparison in New Zealand.
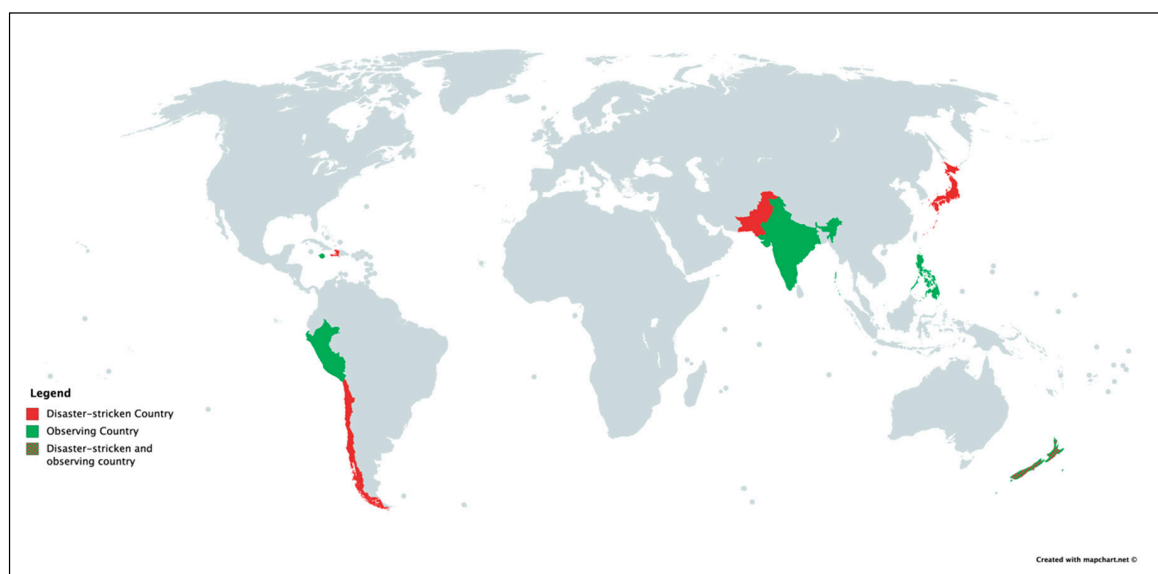

Figure 2. Disaster-stricken and observing communities.
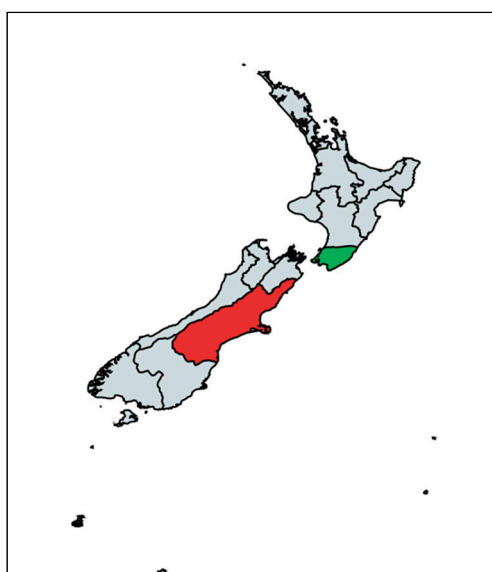
Figure 3. Disaster-stricken and observing communities in New Zealand.

We used five newspapers in observing communities to conduct the analysis. With the earthquake in the respective mirror community in brackets, the newspapers in the sample are the *Hindustan Times* in Delhi (Pakistan), the *Gleaner* in Kingston, Jamaica (Haiti), *El Comercio* in Lima, Peru (Chile), the *Dominion Post* in Wellington (New Zealand), and the *Manila Times* in Manila, Philippines (Japan).

The newspapers were chosen for several theoretical and practical reasons. First, all newspapers are leading daily broadsheet newspapers that provide comprehensive coverage of overseas events. Broadsheet newspapers are an important area to study because they are well read by political elites and politically interested people [54–56] and because they tend to index the current news agenda—meaning they reflect concerns of the public and political elites at the time of publication [55].

Second, all five newspapers serve cities that are vulnerable to earthquakes, but all five communities had not recently experienced a major tremor prior to the final earthquake in our study. As a result, they are likely to be aware of the risks they face in their location, but they are not engaged in their own recovery from disaster, which could bias the results.

Finally, all newspapers had publicly accessible archives that were used to gather articles for our sample, facilitating the research in this paper. The newspapers are also published in English or Spanish, which meant that our coders could read and interpret the text of the articles.

Table 3 presents the circulation figures and the circulation area of the newspapers included in this study for their local audience in descending order by the level of development of the observing country. Please note that the circulation figures likely underestimate the newspapers' readership given the amount of digital news consumption through their websites.

Table 3. The newspapers and their audiences.

Location	Newspaper	Estimated Local Daily Readership	Local Circulation Area
Wellington, New Zealand	*Dominion Post*	159,000 (2018)	Wellington & lower North Island
Kingston, Jamaica	*Gleaner*	509,000 (2012)	Kingston & greater Jamaica
Lima, Peru	*El Comercio*	467,600 (2010)	Lima & central Peru
Manila, Philippines	*Manila Times*	120,700 (2012)	Manila & National Capital Region
Delhi, India	*Hindustan Times*	1,620,000 (2018)	Delhi & National Capital Region

Sources: [57–61].

The dependent variables in the study are communalization and othering. Communalization refers to instances where the local newspaper emphasized similarities between the affected community and the observing community. Coders considered othering as instances where differences between

communities were emphasized. Further details about the coding scheme are provided in Appendix C, including the specific instructions given to the coders.

Communalization and othering were coded at the paragraph level on a yes/no basis, where a paragraph was coded according to whether it featured each type of localization (1), or it did not (0). For instance, if a paragraph featured communalization it would be coded as 1, and if it did not it would be coded as 0. This was repeated for neutral localization and othering, so each paragraph was effectively coded three times. Examples of how this worked in practice, and how the data are subsequently presented in the dataset are available to view in Appendix D. Appendix F reports the frequency of paragraphs featuring communalization and othering across newspapers and earthquakes.

Intercoder reliability tests were conducted on 511 paragraphs that were analyzed by both coders in the study. We report intercoder reliability statistics on the data used in this paper, communalization and othering, in Appendix E. In short, there was a large amount of agreement between the coders, especially for a study that involved implementing a novel coding scheme for the first time. The two graduate coders agreed on 74.6 percent of all paragraphs about communalization and 95.3 percent of all paragraphs about othering.

Because the unit of analysis is a paragraph, all analysis is conducted at the paragraph level. We were interested in estimating the likelihood of each type of localization in the news coverage of earthquakes given the relative development of both the stricken community and the observing community.

We tested the effects of two independent variables on the nature of coverage of distant earthquakes in this study. First, we examine the influence of the level of development of the stricken community on news coverage of distant earthquakes. Given that the last earthquake took place in 2011, we use the 2011 United Nations Human Development Index to measure development. This index is produced to measure three elements critical to human development: "A long and healthy life, access to knowledge, and a decent standard of living" [62] (p. 168). Life expectancy measures the health component, expected and actual years of schooling measure the educational component, and the gross national income per capita measures the standard of living within a country. Indices are created for each of these dimensions, which are then combined and divided by three to produce the eventual Human Development Index score.

Of course, it is important that alternative explanations are controlled for. As a result, we include two control variables for the analysis, but we limit control variables to plausible alternative explanations on the recommendation of prior scholarship [63]. As a result, we use "a small, simple, coherent...regression whose observations can be looked at with care, whose effects can be modeled with no more than a handful of independent variables and whose results can be believed" [63] (p. 338).

The first control variable is the level of development of the observing community on news coverage of distant earthquakes. It is possible that the development of the newspaper's community affects the nature of reporting about distant disasters. As a result, we control for the effect of an observing community's level of development on the probability of communalization and othering.

We include a second control variable that could also have effects on the nature of news coverage. To control for the salience of the disaster, we include a measure to control for the scale of the disaster, which could affect how they are covered. We use a measure to control for the salience of events because there are important differences between stricken country development and the damage caused by disasters.

The measure of disaster damage is the number of people killed by the disaster (logged). Typically, there is a negative relationship between the development of the affected country and the number of people killed by disasters, as developed countries have a greater capacity to prevent the loss of life from disasters than developing countries. However, major disasters can cause a considerable number of deaths in any country depending on the magnitude of the natural hazard, the location of the hazard, and the vulnerabilities of the stricken community.

Table 4 provides descriptive statistics for the variables used in this analysis. The table indicates the large amount of variation in the independent and dependent variables of interest. The data indicates that it is much more common for any given paragraph to feature neither communalization nor othering. Communalization was found 875 times, in just under 25 percent of all paragraphs, while othering was much less apparent, occurring 148 times, in under 5 percent of paragraphs. The following section provides details about we use appropriate estimation models to adjust for the distribution of our dependent variables of interest.

Table 4. Descriptive Statistics.

	Observations	Mean	Std. Dev.	Min.	Max.
Dependent Variables					
Communalization	3501	0.2499286	0.4330333	0	1
Othering	3501	0.0422736	0.2012415	0	1
Independent Variable					
Stricken Community Development (UN HDI)	3501	0.68406	0.206094	0.454	0.908
Control Variables					
Observing Community Development (UN HDI)	3501	0.7286061	0.1323478	0.547	0.908
No. Killed (Log)	3501	9.592109	2.726754	5.198497	12.313

Because the dependent variables are dichotomous, the analysis is conducted using simple logistic regression with robust standard errors. The analysis is conducted at the paragraph unit of analysis to estimate the likelihood of a paragraph featuring communalization or othering in the coverage of distant earthquakes. This model can be expressed as:

$$p(x) = P(Comm = 1|x) = P[\beta_1 SCDev + u > 0|x], \tag{1}$$

where the dependent variable is the probability p that the paragraph features communalization (Communalization = 1). The same model is used to estimate the effect of development on the predicted probability of othering. Information about data and replication materials is provided in the Supplementary Materials.

4. Results

The results indicate clear support for the theory that development influences the nature of coverage of distant disasters. The analysis suggests there is a consistent positive relationship between the level of development of the stricken community and the predicted probability of communalization, and a negative relationship between the development of the stricken community and the predicted probability of othering. In this section, we discuss the findings in greater detail and the implications for the prospect of disaster risk reduction in observing communities.

4.1. Communalization

First, Table 5 presents results for the logit model of the probability of communalization by paragraph. The table illustrates support for the development communalization hypothesis. As expected, the level of development of the stricken community has a statistically significant positive relationship with the likelihood of a paragraph featuring communalization in the coverage of distant events.

In substantive terms, for every one-unit increase in the UN HDI, the log odds of a paragraph featuring communalization increase by 3.425 in the full model where control variables are included. From this result, it appears as though communalization in the news coverage of distant disasters becomes much more likely if the stricken community has a high level of human development. This is a substantively significant result, indicating that the news media are more likely to set the agenda for policy change in response to earthquakes in wealthier communities than poorer communities.

Table 5. Communalization in news coverage of distant earthquakes. DV: The probability that a paragraph in a newspaper article features communalization.

	(1)	(2)	(3)
	Logit (robust s.e.)	Logit (robust s.e.)	Logit (robust s.e.)
Stricken Community Development	1.676 *** (0.196)	1.601 *** (0.197)	3.425 *** (0.291)
Observing Community Development		0.735 ** (0.233)	0.894 *** (0.239)
No. Killed (Log)			0.185 *** (0.023)
Constant	−2.275 *** (0.146)	−2.762 *** (0.215)	−5.920 *** (0.439)
Observations	3501	3501	3501
Pseudo R^2	0.019	0.021	0.038

Note: Standard errors in parentheses. $^+$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 5 also indicates that the level of development of the observing community is related to the likelihood of communalization. There is a positive relationship between the development of the observing community and the predicted probability of communalization. For every one-unit increase in the UN HDI of the stricken community, the log odds of communalization increase by 0.894.

This is an interesting result that implies that a community's own level of development influences the likelihood of lessons being drawn from stricken communities to a newspaper's own community. One explanation could be that news organizations in observing communities with high levels of development have more resources available to make connections between communities, and they might rely less on international wire services than news outlets in developing countries.

A perhaps more compelling explanation is implied in previous research that suggests that for disaster risk reduction to occur in an observing community, there must be the resources available for it to take place [6,7]. A community's development might be positively related to the likelihood of communalization because that community has the capacity to act in response to the disaster in the pursuit of disaster risk reduction at home.

On the other hand, if a newspaper perceives there is little prospect of their community being able to act in pursuit of disaster risk reduction in response to distant events, there is likely less incentive to focus on lessons from the disaster for their own community. This resource capacity might therefore affect the news coverage of distant events. Future studies could explore this relationship in further detail.

The results also indicate that the salience of the disaster plays a role in the likelihood of communalization, with earthquakes with large numbers of casualties increasing the likelihood of lessons being drawn. Substantively, the log odds of communalization increase by 0.185 with every one-unit increase in the logged number of people killed. As a result, the salience of a disaster appears to influence the nature of the coverage.

4.2. Othering

Table 6 presents the logit model for othering. First, the table reports that there is a strong negative relationship between the level of development of the stricken community and the likelihood of othering. A one-unit increase in the UN HDI decreases the log odds of othering by 3.500 in the full model with additional control variables.

This is a strong negative relationship between variables, indicating that disasters in communities with a low level of human development are much more likely to prompt coverage that emphasizes differences between them and the observing community. This has important consequences for disaster risk reduction, as this type of coverage is likely to limit the possibility of policy learning in response to distant disasters.

Table 6. Othering in news coverage of distant earthquakes. DV: The probability that a paragraph in a newspaper article features othering.

	(1)	(2)	(3)
	Logit (robust s.e.)	Logit (robust s.e.)	Logit (robust s.e.)
Stricken Community Development	−2.903 ***	−3.085 ***	−3.500 ***
	(0.483)	(0.469)	(0.899)
Observing Community Development		1.561 **	1.539 *
		(0.605)	(0.602)
No. Killed (Log)			−0.037
			(0.070)
Constant	−1.293 ***	−2.325 ***	−1.676
	(0.292)	(0.559)	(1.312)
Observations	3501	3501	3501
Pseudo R^2	0.036	0.041	0.041

Note: Standard errors in parentheses. $^+$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Similarly, the development of the observing community increases the likelihood of othering in the news coverage of distant earthquakes. For every one-unit increase in the human development of the observing community, the log odds of othering increase by 1.539. Newspapers in more developed communities appear much more likely to emphasize differences between communities in the coverage of distant disasters, reducing the likelihood of policy learning in more developed communities in response to distant events in developing countries.

Interestingly, the salience of the event as measured by the number of people killed does not have a statistically significant relationship with the predicted probability of othering. Instead, it appears as though the likelihood of othering is primarily explained by development.

4.3. Relative Development and Localization

While absolute development appears to have an important influence on the likelihood of communalization and othering, it is also possible that relative development determines how local newspapers cover distant earthquakes. In other, words, it might not be the absolute development of the stricken community that drives communalization or othering—it might be the development compared to that of the observing community.

To test whether this is the case, we created a variable for the difference in development between two communities by subtracting the stricken community's UN HDI from the observing community's UN HDI. We then changed the sign for the observations that were negative (i.e., subtracting Japan's HDI from the Philippines) so that all observations of difference were positive. We then performed additional tests using logit regression models with the other measures of development removed to prevent collinearity.

Table 7 reports analysis using the difference in development as a predictor of the likelihood of communalization in news coverage of earthquakes. The results indicate that the difference in development is negatively correlated with the predicted probability of communalization. For every one-unit increase in the difference in development between communities, the log odds of communalization decrease by 1.969. On the other hand, the number of people killed appears to have no meaningful association with the likelihood of communalization.

Substantively, these results suggest that the further away that two communities are in their relative development, the more the likelihood of communalization decreases. This matches our expectations given the previous tests of the stricken community's development on communalization, but it adds an additional insight into the news coverage of earthquakes, suggesting that relative development might also determine the likelihood of lesson drawing coverage of distant disasters.

Table 8 presents the results of tests using the difference in development to explain the likelihood of othering. Here, the results are different from our expectations given the negative association between stricken community development and othering detailed in Table 6.

Table 7. Differences in development and communalization. DV: The probability that a paragraph in a newspaper article features communalization.

	(1)	(2)
	Logit (robust s.e.)	Logit (robust s.e.)
Difference in Development	−1.880 ***	−1.969 ***
	(0.258)	(0.250)
No. Killed (Log)		0.012 (0.013)
Constant	−0.762 ***	−0.858 ***
	(0.061)	(0.134)
Observations	3501	3501
Pseudo R^2	0.010	0.010

Note: Standard errors in parentheses. $^+$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 8. Differences in Development and Othering. DV: The probability that a paragraph in a newspaper article features othering.

	(1)	(2)
	Logit (robust s.e.)	Logit (robust s.e.)
Difference in Development	0.201	−1.141 $^+$
	(0.657)	(0.670)
No. Killed (Log)		0.209 ***
		(0.041)
Constant	−3.158 ***	−5.032 ***
	(0.151)	(0.485)
Observations	3501	3501
Pseudo R^2	0.000	0.026

Note: Standard errors in parentheses. $^+$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 8 reports the results of these logit regressions. Given that the signs changed between models and that the second model is only statistically significant at the 0.10 level, these results do not report clear effects of the difference in development on the predicted probability of othering. However, the second model reports a one-unit increase in the difference in development decreases the log odds of othering by 1.141, which is a counterintuitive result.

Meanwhile, the number of people killed (logged) has a positive association with the predicted probability of othering, which is what we would expect. For every one-unit increase in the difference in development, the log odds of othering increase by 0.209.

Substantively, news coverage in communities with different levels of development appears to be less likely to feature othering, which is surprising. Again, given the volatility of the effects of difference in development and the fact that the coefficient was not statistically significant at the 0.05 level, it is important to be cautious in the interpretation of the results.

Nevertheless, these results appear to be counterintuitive. One possible explanation could be that there are so few observations of othering in our data that this is somewhat of an anomaly. Alternatively, there are some alternative explanations that are not accounted for in our deliberately parsimonious models. Perhaps more likely, this is an indicator of an asymmetry in the impact of developmental differences, with the media in both lesser and more developed countries distancing themselves from the communities of lesser developed mirror communities. Regardless, future research should explore this further to determine the implications of different levels of development on the likelihood of othering.

4.4. Summary

Collectively, the results have important implications for the understanding of international news flows. Building on previous studies that demonstrate a relationship between development and the frequency of coverage, this analysis demonstrates that the nature of coverage of distant events is also driven by development.

If an earthquake occurs in a community with a high level of development, the news coverage is much more likely to draw lessons for their community, and less likely to emphasize differences that prevent policy learning. Similarly, the greater the difference between communities in their respective levels of development, communalization becomes less likely, preventing lessons from being learned in these instances.

These findings are both theoretically and substantively significant, demonstrating that news coverage of disasters is dependent on the level of development of the affected community.

5. Discussion

The evidence presented in this paper demonstrates the existence of systematic differences in the nature of coverage of distant earthquakes in observing communities. The study tested the determinants of communalization and othering in a systematic fashion using a stratified sample of newspaper articles. The results indicated that as the level of development of the stricken community increases, the likelihood of communalization increases, and the likelihood of othering decreases. Similarly, as the difference in development between communities increases, the likelihood of communalization decreases.

Collectively, these results have important implications for the understanding of the news coverage of distant events, providing systematic evidence about when the news coverage will emphasize similarities or differences between communities. It shows that development matters, both in terms of the stricken community and the observing community.

However, there are important limitations of the study, and scholars should build on these findings in the pursuit of a generalizable theory of development and localization of distant events. Future research should examine variation across different types of events, conduct longitudinal analysis to assess differences in coverage over time, and comparative analysis across news media platforms to further build on these findings towards a better understanding of localization.

Furthermore, all observing communities in this analysis face similar earthquake risks. While this presented us with an opportunity to effectively hold that risk constant while examining the influence of development on news coverage, future research could explore how disaster risk affects coverage in addition to development.

Finally, it is likely that the type of coverage has important implications for the likelihood of policy learning in observing communities. The knowledge about the determinants of localization can be used to develop an enhanced understanding of the conditions under which policy adoption is likely.

The results here suggest that disasters in other communities may be good occasions for campaigns for policy learning because they prompt a chance to reflect on the observing community's own vulnerabilities. Ultimately, more work should be conducted to better understand how these different elements of localization in the news coverage of distant events influence the likelihood of public policies to mitigate threats in at-risk communities.

Conflicts of Interest: T.J. received a scholarship from the *Dominion Post*, one of the five newspapers in the content analysis, during his study at Victoria University of Wellington. The term of the scholarship was completed before this study began, and the newspaper had no involvement in this project. The *Dominion Post* had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the publication of the results.

Appendix A

Sampling Methods

Hindustan Times

1. Log in to the [Institution] library website using your [Institution] login
2. Click on the "Databases" tab
3. Search for "LexisNexis Academic"
4. Click on the "Source Directory: Find" link at the top right of the screen
5. Search for "Hindustan Times" and select this as the source using the "OK–Continue" button
6. Search within the publication using the Advanced Search function

    a. Type "X Country" + "earthquake" for the search
    b. narrow the results to the date range of the earthquake date to the 1st year anniversary of the earthquake e.g., 10/8/2005–10/8/2006
    c. sort the results by publication date (oldest first)
    d. do not include duplicates

7. Divide the entire sample by 20 to find X. Starting from the 1st article, select every Xth article until you have your 20 articles.

    a. If a selected article only fleetingly mentions the earthquake as a peripheral element of another story, please do not use this article and select the next article in its place.

Kingston Gleaner

1. Log in to the Newspaperarchive.com website using [email address] as the username and "localization" as the password
2. Click on the "Advanced Search" tab
3. Search within the publication using the Advanced Search function

    a. Type "X Country" + "earthquake" for the search in the "With all the words" section
    b. narrow the search to the date range of the earthquake date to the 1st year anniversary of the earthquake e.g., 10/8/2005–10/8/2006
    c. narrow the search by publication location using the drop down menu–Jamaica → Kingston → Kingston → Kingston Gleaner
    d. sort the results by publication date (oldest first)
    e. do not include duplicates

4. Divide the entire sample by 20 to find X. Starting from the 1st article, select every Xth article until you have your 20 articles.

a. If a selected article only fleetingly mentions the earthquake as a peripheral element of another story, please do not use this article and select the next article in its place.

El Comercio

1. Log in to the [Institution] library website using your [Institution] login
2. Click on the "Databases" tab
3. Search for "Proquest Latin American Newsstand"
4. Click on the "Publications" tab
5. Search for "El Comercio"
6. Click on the newspaper
7. Search within the publication using the Advanced Search function

   a. add "X Country" + "earthquake" to the search [in the appropriate words in Spanish]
   b. narrow the results to the date range of the earthquake date to the 1st year anniversary of the earthquake e.g., 10/8/2005–10/8/2006
   c. sort the results by publication date (oldest first)
   d. do not include duplicates

8. Divide the entire sample by 20 to find X. Starting from the 1st article, select every Xth article until you have your 20 articles.

   a. If a selected article only fleetingly mentions the earthquake as a peripheral element of another story, please do not use this article and select the next article in its place.

Dominion Post

1. Log in to the [Institution] library website using your [Institution] login
2. Click on the "Databases" tab
3. Search for "Proquest–Multiple Databases"
4. Click on the "News and Newspapers" tab
5. Click on the "Publications" tab
6. Search for "Dominion Post"
7. Click on the link for the newspaper
8. Search within the publication using the Advanced Search function

   a. add "X Country" + "earthquake" to the search
   b. narrow the results to the date range of the earthquake date to the 1st year anniversary of the earthquake e.g., 10/8/2005–10/8/2006
   c. sort the results by publication date (oldest first)
   d. do not include duplicates

9. Divide the entire sample by 20 to find X. Starting from the 1st article, select every Xth article until you have your 20 articles.

   a. If a selected article only fleetingly mentions the earthquake as a peripheral element of another story, please do not use this article and select the next article in its place.

Manila Times

1. Log in to the [Institution] library website using your [Institution] login
2. Click on the "Databases" tab
3. Search for "Proquest–Multiple Databases"

4. Click on the "News and Newspapers" tab
5. Click on the "Publications" tab
6. Search for "Manila Times"
7. Click on the link for the newspaper
8. Search within the publication using the Advanced Search function

    a. add "X Country" + "earthquake" to the search
    b. narrow the results to the date range of the earthquake date to the 1st year anniversary of the earthquake e.g., 10/8/2005–10/8/2006
    c. sort the results by publication date (oldest first)
    d. do not include duplicates

9. Divide the entire sample by 20 to find X. Starting from the 1st article, select every Xth article until you have your 20 articles.

    a. If a selected article only fleetingly mentions the earthquake as a peripheral element of another story, please do not use this article and select the next article in its place.

Appendix B

Taxonomy of Localization

This study involves the assessment of the news coverage of overseas earthquakes in different earthquake-prone communities. Each newspaper article will be coded according to the different types of localization evident in the story. Localization refers to how the newspaper interpreted the overseas earthquake and made it relevant for the readers in their community. There are three different types of localization that are identified for coding in this study.

Communalization

The first of these types of localization is **communalization**, where a direct connection was made between the locale of the newspaper [the observing community] and the disaster stricken community, establishing an affinity between the two communities. All of these would constitute an attempt on behalf of the newspaper to make the overseas earthquake meaningful and relevant to their readership.
This could include:

- explanations or statements indicating why the overseas earthquake is significant to the locality of the newspaper.
- direct comparisons between the two areas, citing the common vulnerability to seismic activity.
- the mention of vulnerabilities in the disaster stricken community that are shared by their locality without explicitly comparing the two communities.

    ○ E.g., descriptions of the technology used in the construction of buildings, the science surrounding the prediction of earthquakes, the type of fault, the natural features that proved to be significant in the tremor, or the measures taken to prepare for the eventuality of the earthquake.

- the reporting of facts that may affect the observing community, including the impact of the earthquake on the global insurance industry or the global economy.

Neutral Localization

The second type of localization is **neutral localization**, where there was a connection made between the stricken community and the observing community which featured neither communalization nor othering.
This could be indicated by:

- references to the presence of citizens of the observing community living in the stricken community
- the citation of people in the observing community with friends or relatives in the stricken community
- the mention of people from the stricken community who were living in the observing community

Othering

The third category of localization is **othering**, involving the practice of emphasizing differences between the locality of the newspaper and the disaster stricken community. This content places blame on the stricken community through citing their disaster risk reduction as being inadequate, especially compared to those measures in the observing community.

This could include:

- explicit references to differences such as the inadequate enforcement of building codes
- social disorder
- a lack of preparedness
- a troubled history
- poverty
- corruption
- poor public infrastructure.

Othering could also involve the citation of factors in the disaster stricken community, which are implied to have contributed to the scale of the disaster, which are implied to not apply for the observing community. This process presents the disaster stricken community as noticeably different to themselves, often implying that they contributed towards the consequences of the earthquake.

These could include:

- poor government decision making
- criticism of the effectiveness of the response and recovery in the stricken community,
- poor construction,
- poor economic policies
- poor leadership
- identification of cultural differences
- identification of different religious practices
- poor treatment of women
- poor treatment of children

Othering could also take place in the establishment of a paternalistic victim-savior relationship between the communities, where the burden is on the observing community to assist the stricken community.

This could involve:

- the observing community's involvement in the earthquake recovery
- the observing community's involvement in the provision of aid to the stricken community.

Appendix C

Coding Scheme

Newspaper

1. Hindustan Times
2. Kingston Gleaner
3. El Comercio

4. Dominion Post
5. Manila Times

Location of Newspaper

1. New Delhi, India
2. Kingston, Jamaica
3. Lima, Peru
4. Wellington, New Zealand
5. Manila, Philippines

Earthquake

1. Pakistan–8 October 2005
2. Haiti–12 January 2010
3. Chile–27 February 2010
4. New Zealand–22 February 2011
5. Japan–11 March 2011

Article #

- Number of article in sample of 20

Date

- Date of the newspaper where article is published (DD-MMM-YY)

Section

- If given, the part of the newspaper where the article is published

Page

- If given, the page of the newspaper where the article is published

Article length

- The number of words in the article.
- If there is no quoted number, this can be estimated by multiplying the number of words in the first line by the total number of lines in the article.

Author

- If given, the author/s of the article, including press agencies like Reuters, AP etc

Byline location

- If given, the location/s where the article was filed by the author/s

Paragraph #

- Each paragraph in the article is to be numbered and given its own row

Communalization

- A yes/no assessment of whether there was communalization in the paragraph

  0. No
  1. Yes

Neutral localization

- A yes/no assessment of whether there was neutral localization in the paragraph

  0. No
  1. Yes

Othering

- A yes/no assessment of whether there was othering in the paragraph

  0. No
  1. Yes

Direct comparisons

- A yes/no assessment of whether there were direct comparisons between the observing community and the stricken community in the paragraph

  0. No
  1. Yes

Shared vulnerabilities

- A yes/no assessment of whether there were discussions of shared vulnerabilities between the observing community and the stricken community in the paragraph

  0. No
  1. Yes

Poor decision-making

- A yes/no assessment of whether there were descriptions of poor government decision-making in the paragraph

  0. No
  1. Yes

Observing Community involvement in provision of aid for Stricken Community

- A yes/no assessment of whether there were descriptions of the observing community being involved in providing aid for the stricken community in the paragraph

  0. No
  1. Yes

Observing Community involvement in Stricken Community response & recovery

- A yes/no assessment of whether there were descriptions of the observing community being involved in response & recovery efforts in the stricken community in the paragraph

  0. No
  1. Yes

Conflict between Observing Community & Stricken Community

- A yes/no assessment of whether there were descriptions of conflict between the observing community and the stricken community

  0. No
  1. Yes

Appendix D

Examples of Applications of the Coding Scheme

The Lessons from Christchurch
Author: Unknown author
Newspaper: *Dominion Post*
Date: March 2, 2011
Earthquake: New Zealand earthquake
Key: Bold = Communalization   *Italic = Neutral Localization*   <u>Underline = Othering</u>

1. **IF THE first Christchurch earthquake did not wake up Wellington's civic leaders, the second must. Urgent action is required to reduce the risk posed by earthquake-prone buildings in the capital.**

2. The city should be a safe place to work, live and shop. At present, parts of it are not.

3. Since the Building Act was revised in 2004 Wellington City Council has been assessing older buildings in the city. Its initial investigations identified about 3800 buildings that potentially presented an unacceptable risk. Most were commercial and multi-unit apartment buildings built before 1976.

4. Of that 3800, almost 1500 have subsequently been declared up to standard and 161 confirmed as earthquake risks. The rest have either yet to be assessed or are the subject of negotiations between the council and owners. The council's best guess is that about 600 buildings will eventually require strengthening to bring them up to the minimum standard for older buildings—one-third of the standard required of new buildings. The risks are scattered throughout the city, not just in historic precincts such as Cuba St.

5. Initially, the deadline for upgrading "quake-prone" buildings was set at five to 15 years, but in 2009 it was extended to between 10 and 20 years, after building owners pleaded for more time.

6. After the first Christchurch quake then-mayor Kerry Prendergast called for a review of council policy, including the deadlines. The council is scheduled to be briefed on the parameters of the review later this month. After the second quake it has been obvious that quicker action is required. The council and building owners are gambling with people's lives. If the "Big One", predicted for Wellington some time in the next few hundred years, strikes before buildings are strengthened lives will be unnecessarily lost.

7. The Christchurch quake illustrates just what a difference the quality of buildings makes to the chances of survival. Some buildings were reduced to rubble; others emerged virtually unscathed.

8. In its wake, it is incumbent on the council and building owners to take a fresh, hard-headed look at the city. A balance must be struck between safety, cost and heritage. Older buildings add greatly to the charm of the capital, but this should not be at the cost of human life.

9. Some buildings must be preserved because of what they contribute to the city. If it is necessary for ratepayers to contribute to the cost of strengthening buildings that add to the city's unique character, then so be it. In other cases, if owners are unwilling, or unable, to bring their buildings up to scratch they should be declared unable to be occupied so new, safer replacements can be constructed.

10. **The lessons of Christchurch must be learned. As things stand, people could for the next 20 years live in, work in, and pass by buildings that do not meet minimum standards. The low-priority category of buildings eligible for 20-year stays of execution includes hotels, office buildings and apartment buildings of less than 15 storeys. That is not acceptable.**

Table A1. Presentation of Data in Dataset.

Article ID	Paragraph	Communalization	Neutral Localization	Othering
4-4-3	1	1	0	0
4-4-3	2	0	0	0
4-4-3	3	0	0	0
4-4-3	4	0	0	0
4-4-3	5	0	0	0
4-4-3	6	0	0	0
4-4-3	7	0	0	0
4-4-3	8	0	0	0
4-4-3	9	0	0	0
4-4-3	10	1	0	0

A longing for fresh air and a good sleep brings tsunami victims to stay in NZ
Author: Torrie, Bronwyn
Newspaper: *Dominion Post*
Date: March 19, 2011
Earthquake: Japan earthquake
Key: Bold = Communalization   *Italic = Neutral Localization*   Underline = Othering

1. *JAPANESE earthquake victims are coming to New Zealand to escape the threat of radiation and fear of tsunamis under a scheme launched by a Facebook group.*

2. *Ayaka Hiyamizu, 31, and her son Rakuto, 3, arrived in Wellington yesterday to stay with a Wellington couple for two months.*

3. *Mrs Hiyamizu, a tutor, wanted to leave her city Hachinohe in Japan's northeast because she feared radiation was causing her son's facial eczema to flare up.*

4. *She was looking forward to the fresh "nuclear-free" air and getting a good night's sleep while staying at Roger and Lim Meecham's Miramar home.*

5. *Her husband could not leave Japan because of his job, she said.*

6. *The Time out in NZ scheme arranges for Kiwi hosts to take in Japanese quake victims for up to 90 days. It was created by the people behind the Japan New Zealand noticeboard on Facebook, who had organised reduced airfares, and is supported by the New Zealand embassy in Tokyo.*

7. The Meechams had hosted international students for 20 years and heard about the scheme through their contacts.

8. *Mr Meecham turned up at the airport with a toy digger for Rakuto and Mrs Meecham had prepared a welcome dinner. The couple said they would appreciate people from the Japanese community getting in touch as Mrs Hiyamizu speaks limited English.*

Table A2. Presentation of Data in Dataset.

Article ID	Paragraph	Communalization	Neutral Localization	Othering
4-5-16	1	0	1	0
4-5-16	2	0	1	0
4-5-16	3	0	1	0
4-5-16	4	0	1	0
4-5-16	5	0	1	0
4-5-16	6	0	1	0
4-5-16	7	0	0	0
4-5-16	8	0	1	0

Quake-hit women, kids in Pak subjected to sexual abuse: UN report
Author: Asian News International
Newspaper: *Hindustan Times*
Date: February 13, 2006
Earthquake: Pakistan earthquake
Key: Bold = Communalization   *Italic = Neutral Localization*   Underline = Othering

1. Children and women in quake-hit areas in Pakistan are being subjected to sexual and physical abuse, and they are falling in the trap of human trafficking, a United Nations report has said.

2. There was also evidence that there was an increased risk of domestic violence in these areas because of lack of employment and growing poverty, the report added.

3. According to it, children in the quake-affected areas were vulnerable to psychological problems, drug use, crime, sexual and economic exploitation and human trafficking, and face risks of forced displacement and human rights violations. They reportedly don't have equal access to relief supplies, services and economic opportunities. Marginalised groups in relief camps, such as the disabled, the elderly, ethnic and religious minorities, the illiterate and drug addicts, are also vulnerable, the report added.

4. The Daily Times quoted the UN report as saying that there was a possibility of increase in crime, social injustice and poverty in the NWFP and PoK.

5. It warned that issues such as human trafficking were a key concern. "As time goes on, some risks evolve while others might disappear. Long-term displacement and poverty make people vulnerable to substance abuse, HIV/AIDS, domestic violence, crime and human trafficking," the paper quoted it as saying further.

6. "Women's entitlement to property is of particular concern in earthquake-affected areas given the discriminatory inheritance practices," it added.

7. Quoting the figures of the United Nations Population Fund (UNFPA), the report claimed that around 17,000 pregnant women in these areas were expected to give birth in the next two months, even as 1200 of them might face major complications and around 400 would require surgical assistance.

8. The UNFPA also warned that the health of these pregnant women was at risk due to the shock and trauma they suffered in the October 8 earthquake.

Table A3. Presentation of Data in Dataset.

Article ID	Paragraph	Communalization	Neutral Localization	Othering
1-1-11	1	0	0	1
1-1-11	2	0	0	1
1-1-11	3	0	0	1
1-1-11	4	0	0	1
1-1-11	5	0	0	1
1-1-11	6	0	0	1
1-1-11	7	0	0	0
1-1-11	8	0	0	0

Appendix E

Intercoder Reliability

To assess the extent of agreement between coders in their classification of communalization and othering on 511 paragraphs that were coded by both, we employed a range of widely-used tests of intercoder reliability. Table A4 reports the amount of agreement between coders, as well as coefficients for commonly used tests of intercoder reliability, included Brennan and Prediger's kappa, Cohen's

kappa, Fleiss' pi, Gwet's AC, and Krippendorff's alpha, with standard errors for the latter reported in brackets.

All coefficients for communalization and othering are statistically significant, with the exception of Cohen/Conger's kappa and Fleiss' pi for othering despite a very high amount of agreement, which is likely explained by the assumptions made by those two calculations about the agreement being explained by chance.

In sum, the tests indicate that there was a reasonable amount of agreement between coders, indicating that the coding was significantly more accurate than if it was performed by chance.

Table A4. Intercoder Reliability Tests. *** $p < 0.001$.

Variable	Percent Agreement	Brennan and Prediger's Kappa	Cohen/Conger's Kappa	Fleiss' Pi	Gwet's AC	Krippendorff's Alpha (95% CI)	Observations
Communalization	0.7456	0.4912 ***	0.3021 ***	0.2921 ***	0.6029 ***	0.2928 (0.1978, 0.3877)	511
Othering	0.9530	0.9061 ***	0.0530	0.0528	0.9506 ***	0.0538 (−0.0910, 0.1985)	511

Appendix F

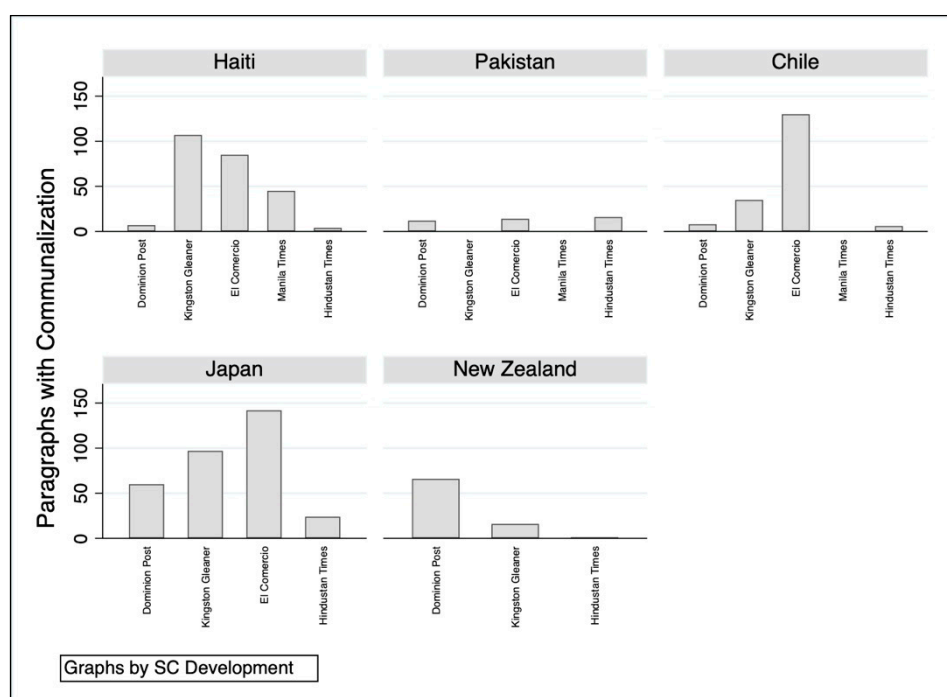*The Distribution of Localization by Earthquake and Newspaper*

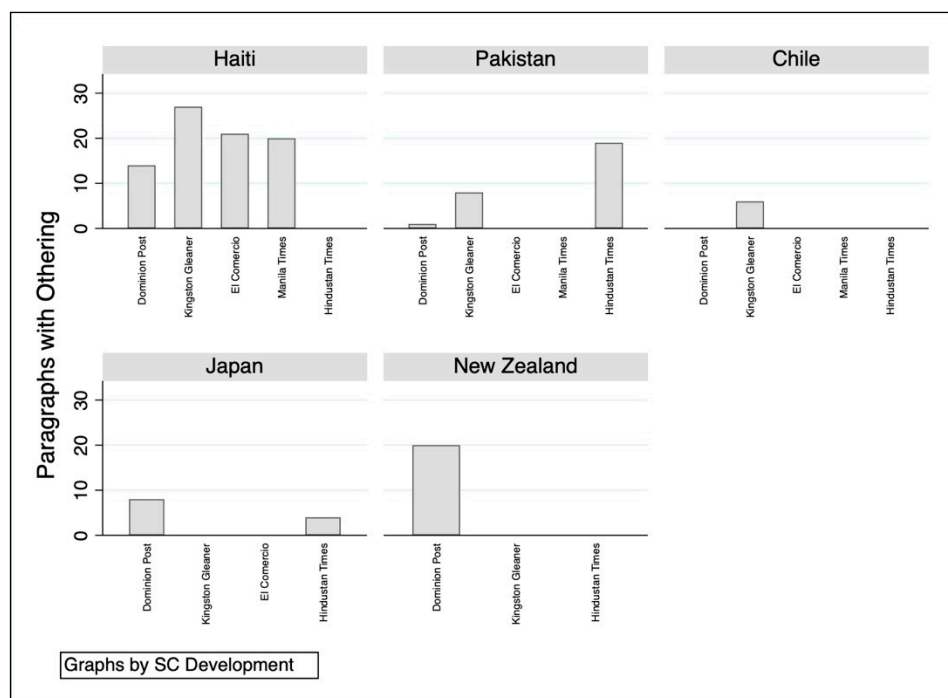**Figure A1.** Paragraphs with Communalization by Earthquake and Newspaper.

Figure A2. Paragraphs with Othering by Earthquake and Newspaper.

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