

(Mis)characterizations of Older and Historic Buildings in Post-Earthquake Reconnaissance Reports

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For bibliography, acknowledgements,
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Introduction

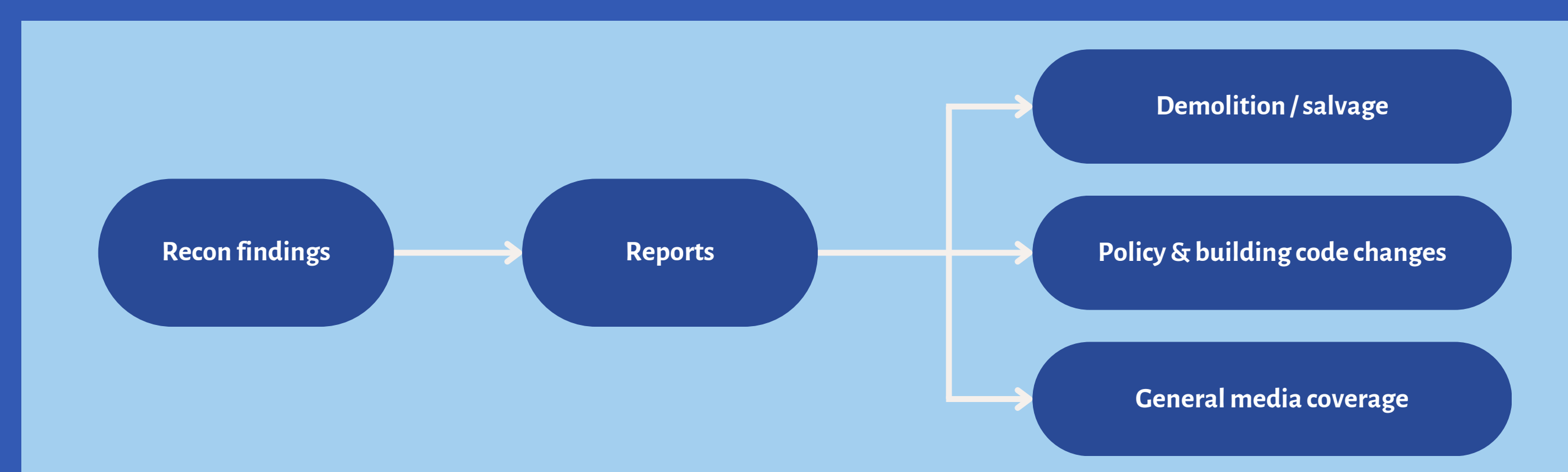
Many professional engineering associations organize post-disaster reconnaissance (“recon”) to assess and record damage patterns. These missions’ goals include discerning whether affected buildings require demolition and distilling “lessons” to prepare for future hazards.

Given these aims, the conclusions that these teams draw and disseminate in their reports can perpetuate particular perceptions about different types of buildings and impact post-hazard decision-making.

Objective

How have structural engineers characterized the performance of older and historic buildings following earthquakes?

Are there preexisting assumptions about older buildings underlying these reports and, if so, how might we reconsider how professionals undertake post-disaster reconnaissance?



Why studying recon matters: examples of the wider influence of recon reports.

Methodology

Textual Analysis

Textual analysis can elucidate which terms occur together most frequently within these reports and test what qualities or perceptions have been most associated with “old” construction (Journey 1993; Pera and Shea 1991; Seltzer 1993).

The dataset comprises recon reports from by the Earthquake Engineering Research Institute, who have published reports for recon missions since the 1970s.

Document Review

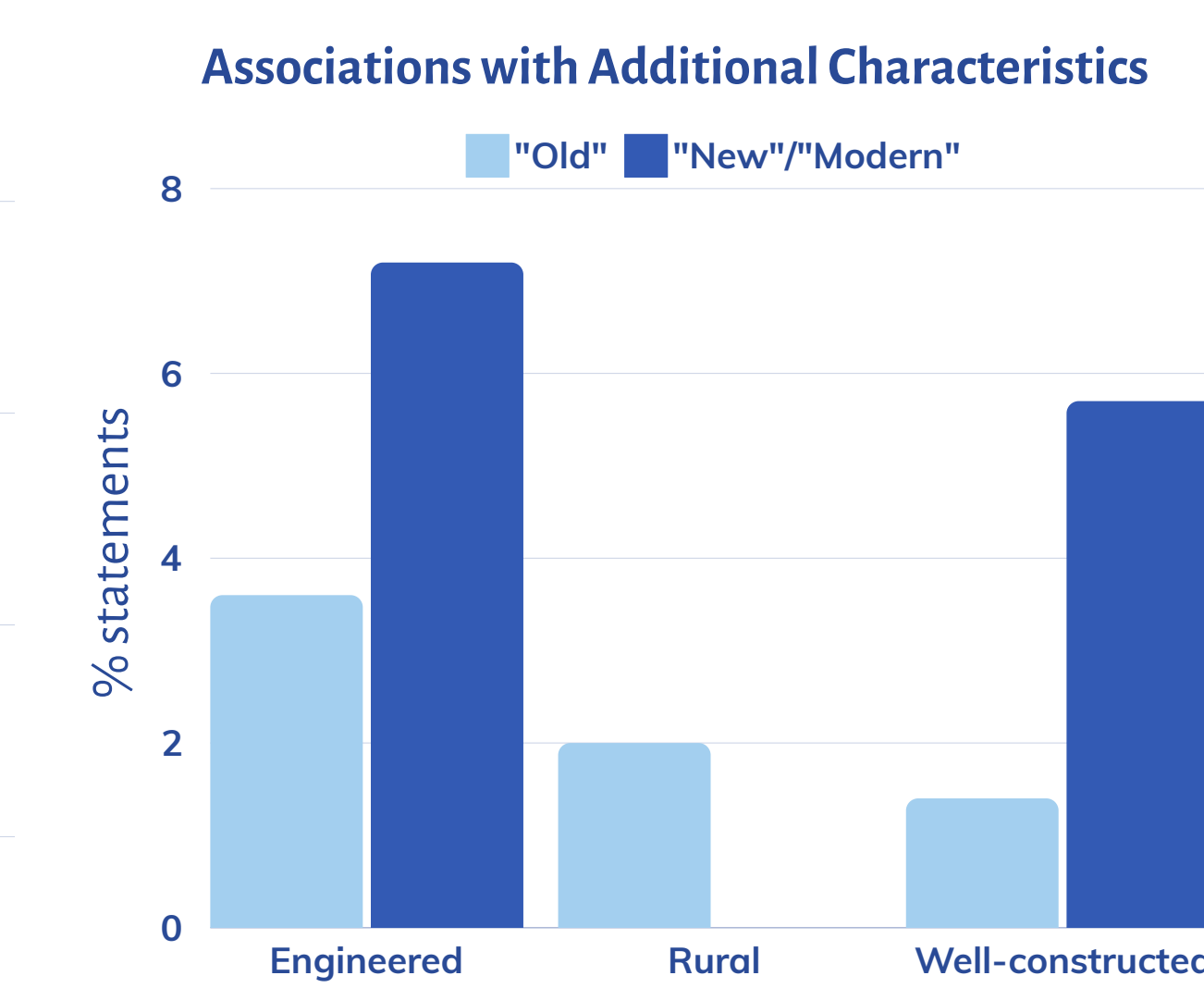
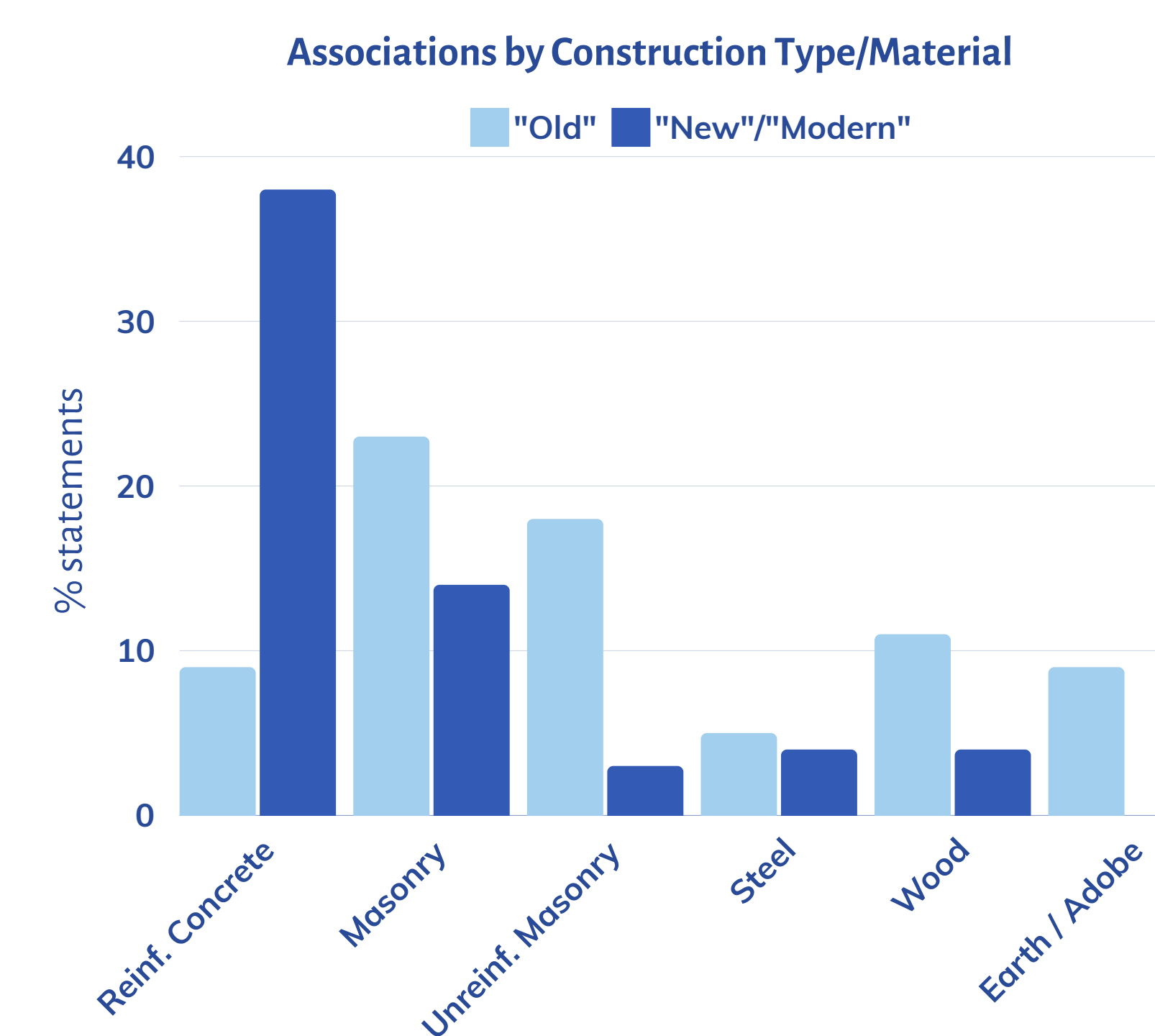
Analyzing additional institutional documents and publications help refine coding procedures for textual analysis and further contextualize findings.

DATASET:

- n = 2,348 statements
- 22 events (1971–1989)
- Geographic focus on US & Latin America

Results & Discussion

Enforcing categorical separation and opposition between “old” and “modern,” “engineered” structures

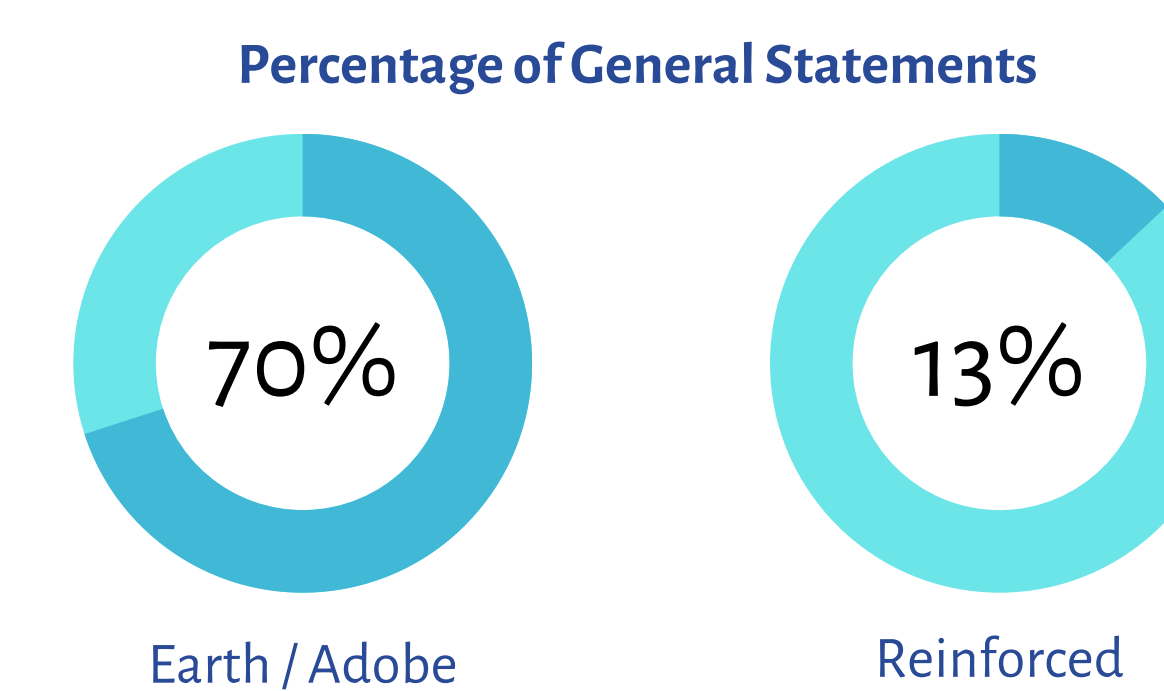


Reinforced concrete structures, and “engineered” or “well-constructed” buildings are more often identified as “modern” or “new.”

No statements in this dataset have described earthen buildings or construction in rural areas as “modern.”

Relatedly, adjacent statements within reports often directly contrast (e.g., phrases like “meanwhile,” “on the other hand,” “as opposed to”) “old” buildings and those that are “engineered” or “well-designed” and follow building codes.

Disparities in providing examples to corroborate generalizations



The reports tend to provide more specific examples to validate general statements about reinforced concrete, a “modern” material, than for earthen construction. Many general statements about damage to earthen construction are from hearsay and more extreme (e.g., “all adobe homes in the whole town collapsed.”)

Firsthand reflections and secondary sources have also pointed to recon efforts prioritizing the assessment of “modern” or “engineered” structures (e.g., EERI 1971; Scott 1994) as well as damage over successes (Spence 2007).

Historic preservation as barrier to safety and progress

Engineering recon reports almost exclusively portray preservation organizations as actors impeding the achievement of better structural safety by protesting the demolition of potentially hazardous structures based on their historic status (e.g., EERI 1996, 2003). This further depicts older and historical buildings, often categorically and indiscriminately, as threats in earthquake scenarios.

Conclusions & Next Steps

- As authoritative, “scientific” documents (Windsor 1993), recon reports contain and perpetuate “shorthands” that perpetuate certain associations and perceptions of different types of buildings. This study’s findings elaborate on existing discussions around the limitations and issues around post-hazard recon (Burton 2023; Gebbeken et al. 2012).
- The need to reexamine such underlying preconceptions is relevant across hazard types, especially as the climate crisis increases the severity of future events and urges more prudent use of our existing built environment.
- The dataset will expand to include more events within a larger date range. The full dataset will undergo statistical tests and more fine-grained analysis.