

# Fear of stricter regulations spurs gun sales after mass shootings, new analysis suggests

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It's commonly known that gun sales go up after a mass shooting, but two competing hypotheses have been put forth to explain why that's the case: is it because people fear more violence and want to protect themselves,

or is it because mass shootings trigger discussions about tighter gun regulations, which sends people out to stock up? In a new study appearing August 11 in the journal *Patterns*, investigators used data science to study this phenomenon. By working with spatio-temporal data from all the states in the US, they determined that the increase in firearm purchases after mass shootings is driven by a concern about regulations rather than a perceived need for protection.

"It's been well documented that mass shootings are linked to increases in firearm purchases, but the motivation behind this connection has been understudied," says first author Maurizio Porfiri, Institute Professor at the New York University Tandon School of Engineering, who is currently on research sabbatical at the Technical University of Cartagena in Spain. "Previous research on this topic has been done mostly from the perspective of social science. We instead used a [data-science](#) approach."

Porfiri and his colleagues employed a statistical method called transfer entropy analysis, which is used to study large, [complex systems](#) like financial markets and climate-change models. With this approach, two variables are defined, and then computational techniques are used to determine if the future of one of them can be predicted by the past of the other. "This is a step above studying correlation," Porfiri explains. "It's actually looking at causation. Unique to this study is the analysis of spatio-temporal data, by examining the behavior of all the US states"

The data that were put into consideration came from several sources: FBI background checks, which enabled the approximation of monthly gun sales by state; a Washington Post database on mass shootings; and news coverage about mass [shooting](#) from five major newspapers around the country. The [news stories](#) were put in two categories: those that mentioned gun regulations and those that didn't. In all, the study used data related to 87 mass shootings that occurred in the United States between 1999 and 2017.

The researchers also rated individual states by how restrictive their gun laws are. "We expected to find that gun sales increased in states that have more permissive gun laws, but it was less expected in states with restrictive laws. We saw it in both," Porfiri says. "Also, when we looked at particular geographic areas, we didn't find any evidence that [gun sales](#) increased when mass shootings happened nearby."

He adds that one limitation of the data is that [news coverage](#) may not fully capture public sentiment at a given time. In addition, although the study was successful in determining causal links among states, more work is needed to study the nature of these relationships, especially when one has laws that are much more restrictive than another

Porfiri usually uses computational systems to study topics related to engineering, including ionic polymer metal composites and underwater robots. His reason for studying mass shootings is personal: he received his Ph.D. in 2006 from Virginia Tech, which, the following year, was the site where—at that time—the deadliest mass shooting in the country took place. One member of his Ph.D. committee was killed in the shooting, and he knew many others who were deeply affected.

For him, this project is part of a larger effort to study gun violence. "Mass shootings are a small part of death from guns," Porfiri says. "Suicide and homicide are much more common. But [mass shootings](#) are an important catalyst for a larger discussion. I plan to look at the wider role of guns in the future."

**More information:** *Patterns*, Porfiri et al. "Self-protection versus fear of stricter firearm regulations: examining the drivers of firearm acquisitions in the aftermath of a mass shooting"  
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