The effect of environmental disasters on citizens perception and preferences: The cross-cultural comparison

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Motivation

Economic impact of natural disasters

- Environmental disasters reduce income per capita (Hsiang & Jina, 2014)
- Channels are mixed, both negative & positive across short- & long-run (Roth Wilson, 2024)
- Channels may differ between disasters (Ehlers et al., 2025)

Sentiment in macroeconomics

- Bordalo, Gennaioli, & Shleifer:
  - **Salience** in consumer choice (JEP 2012), asset prices (AER 2013)
  - **Overreaction** in macro expectations (AER 2020)

Preference malleability & visceral states

- Major life history events shaping attitudes (Malmendier Nagel, 2011; Baker et al., 2020)
- Hot-cold visceral states (Loewenstein, 2000)

This paper

What happens?

- Exogenous shocks across domains
- Focus on wildfires and floods (GR, US)

What do we want to know?

- Do shocks shift attitudes?
- Is it backed by shifts in beliefs?
- Do effects last?
- Do they affect economic sentiment?
- How much responsibility do people assign to the current government?

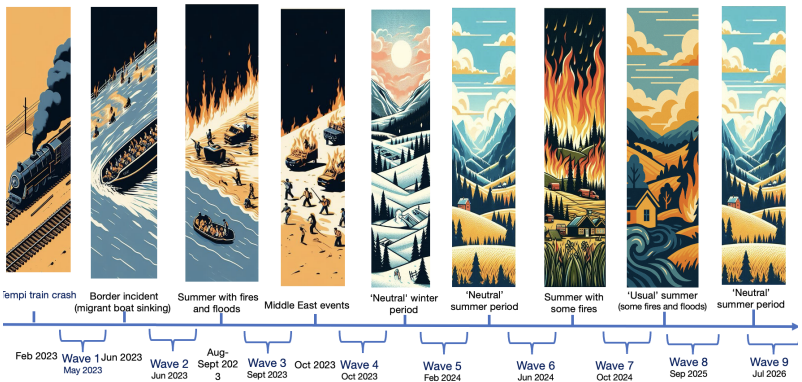
What do we measure?

- Preferences for resource allocation
- Probability of future disasters
- Economic sentiment
- Blame attribution

Why is it problematic if people overreact?



Timeline Greece

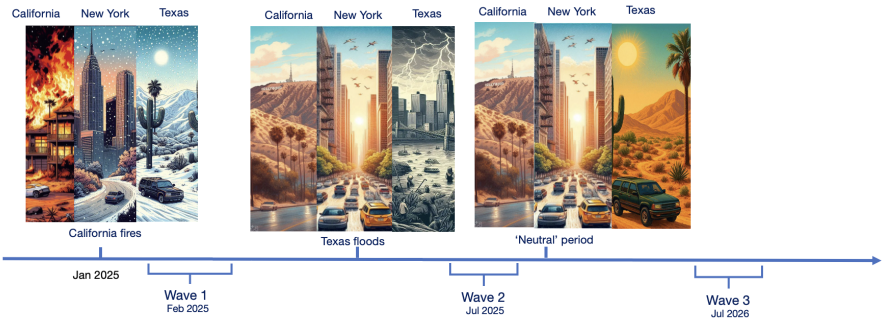


$n \sim 7'000$, quotas on sex, age group, and region

Sample characteristics — Geece

Characteristic	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave 7	Wave 8	Total Sample	Greece*
Gender										
Males	52.5%	54.4%	54%	52.6%	48.3%	52.7%	52%	51.3%	52.3%	48.9%
Females	47.5%	45.3%	45.8%	47.4%	51.7%	47.3%	48%	48.7%	47.6%	51.1%
Other	0%	0.4%	0.2%	0%	0%	0%	0%	0%	0.1%	-
Mean Age	40.2 (12.25)	38.4 (12.53)	41.3 (14.13)	41.7 (13.99)	42.8 (14.18)	44.1 (13.95)	46.9 (14.68)	48.8 (16.16)	42.7 (14.32)	45.8
Age Groups										
18-24	12.1%	15.53%	12.76%	16.2%	13.7%	8.99%	9.1%	9.04%	12.55%	7.73%
25-34	24.31%	27.18%	22.52%	16.03%	20%	18.96%	14.27%	13.7%	19.69%	12.71%
35-44	23.42%	26.24%	25.67%	26.28%	20.37%	24.16%	19.03%	17.94%	23.01%	16.26%
45-54	26.86%	17.29%	19.06%	20.33%	18.7%	21.07%	21.3%	19.35%	20.87%	18.69%
55-64	10.65%	11.76%	11.5%	15.87%	22.04%	19.24%	23.47%	16.53%	15.93%	17.08%
65+	2.66%	2%	8.5%	5.29%	5.19%	7.58%	12.82%	23.45%	7.94%	27.54%
Median Monthly Income	985 (477.89)	924 (458.13)	1,128 (1,636.18)	-	1,418 (10,705.88)	1,235 (7,123.26)	1,300 (7,763.14)	1,875 (2,418.13)	1,158 (5,922.1)	1381
Region										
Aegean Islands	5.44%	3.8%	2.99%	4.11%	4.07%	6.46%	3.21%	1.61%	3.99%	4.99%
Central Greece	47.06%	48.69%	49.92%	71.07%	43.52%	30.48%	47.47%	59.3%	49.06%	43.07%
Crete	6.22%	4.63%	4.88%	2.68%	5.93%	8.15%	4.55%	2.93%	5.05%	5.96%
Epirus	4.44%	3.44%	2.52%	7.32%	2.22%	5.76%	2.38%	2.49%	3.75%	3.05%
Ionian Islands	1.55%	1.43%	1.57%	0.71%	0.93%	1.83%	1.03%	0.44%	1.22%	1.95%
Macedonia	16.54%	23.4%	22.2%	0.89%	23.7%	22.75%	24.41%	23.57%	20.19%	21.62%
Peloponese	8.66%	6.53%	6.3%	11.96%	7.78%	11.38%	8.17%	5.42%	8.2%	9.50%
Thessaly	6.22%	4.99%	5.83%	1.25%	7.22%	9.97%	7.14%	3.37%	5.89%	6.57%
Thrace	3.88%	3.09%	3.78%	0%	4.63%	3.23%	1.65%	0.88%	2.65%	3.30%
Observations (% of total sample)	901 (15.22%)	850 (14.36%)	635 (10.73%)	605 (10.22%)	540 (9.12%)	712 (12.03%)	967 (16.34%)	708 (11.96%)	5,918 (100%)	-

Timeline US

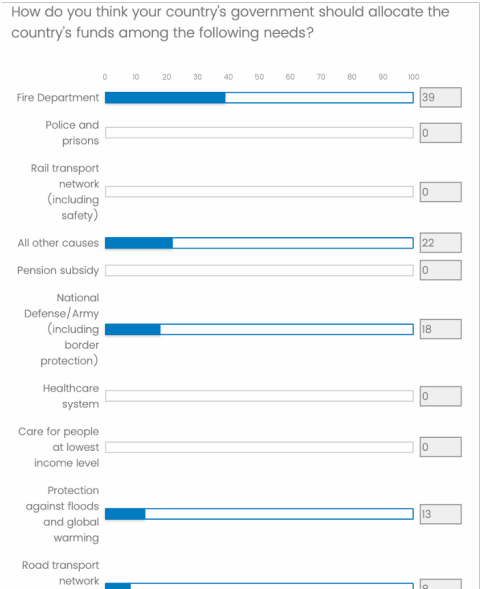


$n \sim$ 6'000, quotas on sex, age group, and state

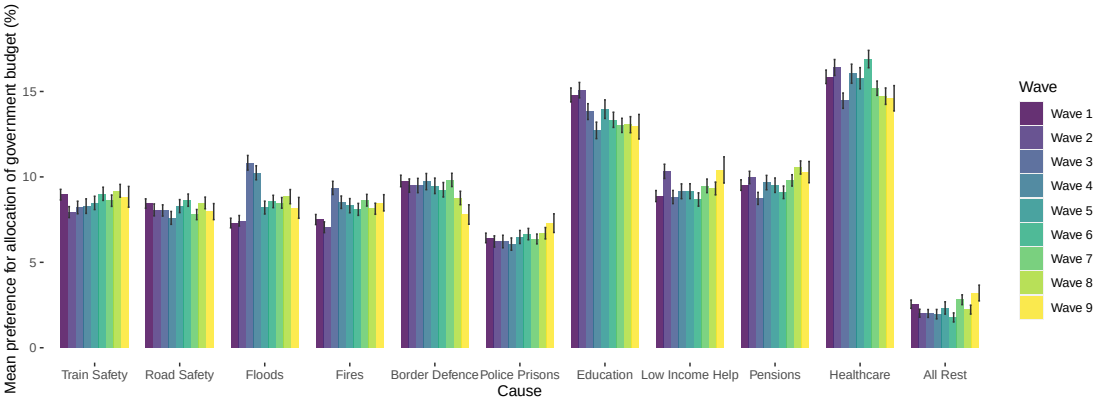
Sample characteristics — USA

Variable	Wave 1	Wave 2	Wave 3	Total Sample	US Population*
Gender					
Males	43.83%	44.61%	47.66%	45.14%	49.5%
Females	56.17%	55.39%	52.34%	54.86%	50.5%
Mean age					
Mean age	47.00	46.85	44.81	46.38	39.1 (median age)
(SE)	(16.91)	(17.01)	(15.72)	(16.68)	
Age groups					
18–24	11.99%	12.77%	11.78%	12.27%	11.7%
25–34	17.60%	17.68%	19.38%	18.09%	17.3%
35–44	15.97%	15.04%	19.63%	16.50%	17.1%
45–54	17.45%	16.95%	19.31%	17.71%	15.3%
55–64	14.74%	15.96%	15.45%	15.45%	15.7%
65+	22.24%	21.61%	14.45%	19.98%	22.9%
Monthly income					
Median	3,333.33	6,250.00	3,333.33	3,333.33	$6,800
Mean	5,720.63	6,373.55	5,801.55	6,025.07	
(SE)	(5,689.29)	(6,451.52)	(6,159.94)	(6,156.67)	
State distribution					
California	33.83%	33.64%	34.89%	34.02%	11.59%
New York	32.14%	31.95%	29.28%	31.33%	5.84%
Texas	34.03%	34.41%	35.83%	34.65%	9.20%
Observations	1,960	2,726	1,605	6,291	-

Resource allocation question



Resource allocation responses - overview



Does a negative shock in a topic lead to higher allocations for that topic? GR

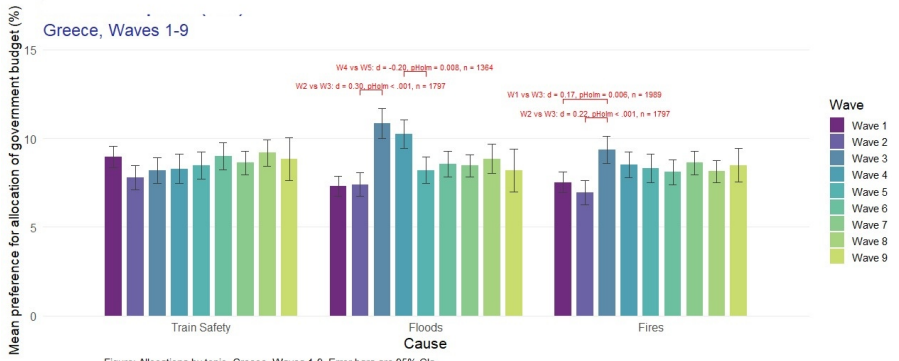


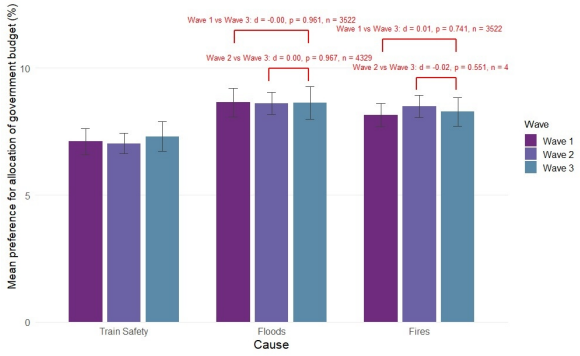
Figure: Allocations by topic, Greece, Waves 1-9. Error bars are 95% CIs.

- In Greece - yes, temporarily

Greece: Temporary jump in spending allocations

	Dependent variable:							
	Alloc Fires Prevention			Alloc Floods Prev			Alloc Trains Prev	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Wave 2	-0.67	-0.68	-0.80*	0.12	0.18	0.06	-0.86*	-1.03**
	(0.44)	(0.44)	(0.47)	(0.45)	(0.44)	(0.47)	(0.44)	(0.47)
Wave 3	1.86***	1.55***	1.48***	3.88***	3.38***	3.44***	-0.54	-0.50
	(0.52)	(0.54)	(0.55)	(0.53)	(0.54)	(0.55)	(0.54)	(0.55)
Wave 4	1.10**			3.10***				
	(0.51)			(0.52)				
Wave 5	0.55	0.15	0.12	0.92*	0.72	0.75	-0.20	-0.20
	(0.53)	(0.59)	(0.60)	(0.54)	(0.59)	(0.60)	(0.58)	(0.59)
Wave 6	0.54	0.35	0.49	1.31***	1.25**	1.25**	0.57	0.55
	(0.49)	(0.52)	(0.53)	(0.50)	(0.52)	(0.53)	(0.52)	(0.53)
Gender:Male	-0.26	0.14	0.12	-1.04***	-0.99***	-0.95***	-0.91***	-0.82**
	(0.30)	(0.33)	(0.34)	(0.31)	(0.33)	(0.34)	(0.33)	(0.34)
Age	-0.06***	-0.07***	-0.07***	-0.01	0.0003	0.001	-0.02**	-0.02*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Education	-0.36***	-0.26**	-0.27*	0.10	0.11	0.04	-0.11	-0.15
	(0.12)	(0.13)	(0.14)	(0.12)	(0.13)	(0.14)	(0.13)	(0.14)
Income		0.0001*	0.0001		0.0000	0.0000	-0.0000	-0.0000
		(0.0000)	(0.0000)		(0.0000)	(0.0000)	(0.0000)	(0.0000)
Basic numeracy		-1.67***	-1.79***		-0.83*	-0.79*	-0.22	-0.25
		(0.43)	(0.44)		(0.43)	(0.44)	(0.43)	(0.44)
Prob Fire		0.003	0.001		-0.01	-0.01	-0.005	-0.004
		(0.01)	(0.01)		(0.01)	(0.01)	(0.01)	(0.01)
Prob Flood		0.02**	0.02**		0.03***	0.03***	-0.02**	-0.02**
		(0.01)	(0.01)		(0.01)	(0.01)	(0.01)	(0.01)
Prob Train		-0.004	-0.004		-0.004	-0.01	0.04***	0.04***
		(0.01)	(0.01)		(0.01)	(0.01)	(0.01)	(0.01)
Central Greece			-0.17			-0.48		-1.12
			(0.78)			(0.78)		(0.77)
Crete			-2.56***			-0.21		-0.99
			(0.98)			(0.98)		(0.98)
Epirus			-1.36			-0.45		-1.38
			(1.11)			(1.11)		(1.10)
Ionian Islands			-1.90			-0.51		-1.81
			(1.52)			(1.51)		(1.51)
Macedonia			-0.05			-0.86		-1.13
			(0.82)			(0.82)		(0.81)
Peloponese			-0.28			-0.42		-1.09
			(0.94)			(0.94)		(0.93)
Thessaly			-1.52			-0.20		-0.61
			(0.96)			(0.96)		(0.96)
Thrace			0.50			-0.65		-0.23
			(1.14)			(1.14)		(1.13)
Constant	12.21***	12.13***	12.78***	7.63***	7.43***	8.19***	11.22***	12.36***
	(0.89)	(1.06)	(1.30)	(0.90)	(1.06)	(1.30)	(1.06)	(1.29)
Observations	4,548	3,943	3,765	4,548	3,943	3,765	3,943	3,765
R^2	0.01	0.02	0.03	0.02	0.02	0.02	0.02	0.02
Adjusted R^2	0.01	0.02	0.02	0.02	0.02	0.02	0.01	0.01
Residual Std. Error	10.06 (df = 4539)	10.13 (df = 3930)	10.27 (df = 3744)	10.26 (df = 4539)	10.13 (df = 3930)	10.26 (df = 3744)	10.08 (df = 3930)	10.23 (df = 3744)
F Statistic	7.94*** (df = 8; 4539)	7.20*** (df = 12; 3930)	5.10*** (df = 20; 3744)	12.65*** (df = 8; 4539)	8.24*** (df = 12; 3930)	4.75*** (df = 20; 3744)	5.31*** (df = 12; 3930)	3.24*** (df = 20; 3744)
Note:								*p<0.1; **p<0.05; ***p<0.01

Does a negative shock in a topic lead to higher allocations for that topic? US



- No detectable change in the US

No detectable change in the US

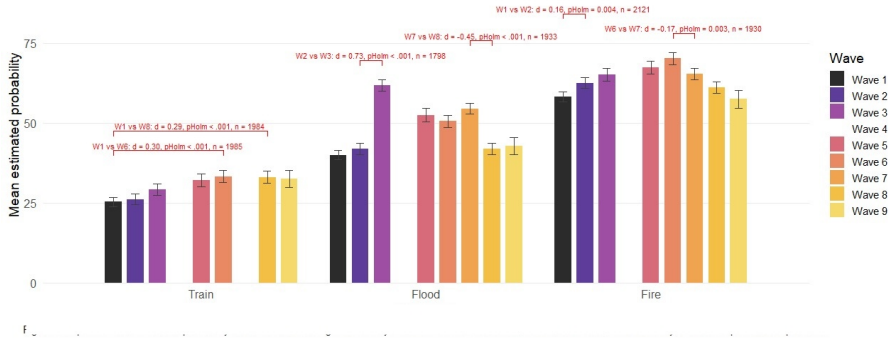
	FireSpend			FloodSpend		
Wave 2 (ref: Wave 1)	0.173	0.255	0.335	-0.179	-0.213	-0.186
	(0.562)	(0.565)	(0.561)	(0.634)	(0.641)	(0.646)
Wave 3 (ref: Wave 1)	-0.569	-0.376	-0.230	0.174	0.019	0.162
	(0.605)	(0.610)	(0.609)	(0.753)	(0.755)	(0.759)
California (ref: New York)	1.308**	1.413**	1.493**	-0.491	-0.504	-0.420
	(0.597)	(0.599)	(0.602)	(0.682)	(0.688)	(0.693)
Texas (ref: New York)	-0.152	-0.138	0.013	0.023	-0.325	-0.306
	(0.567)	(0.571)	(0.571)	(0.723)	(0.709)	(0.711)
Wave 2 x California	-0.587	-0.657	-0.710	0.161	0.177	0.177
	(0.793)	(0.798)	(0.797)	(0.879)	(0.885)	(0.891)
Wave 2 x Texas	1.068	0.991	0.947	0.247	0.447	0.227
	(0.792)	(0.793)	(0.792)	(0.909)	(0.902)	(0.907)
Wave 3 x California	0.214	0.078	-0.051	-0.010	0.103	-0.074
	(0.884)	(0.889)	(0.891)	(1.040)	(1.048)	(1.055)
Wave 3 x Texas	1.694*	1.525*	1.299	-0.525	-0.193	-0.410
	(0.889)	(0.898)	(0.890)	(1.093)	(1.084)	(1.089)
Gender: Male (ref: Female)		-0.632**	-0.562*		-0.427	-0.399
		(0.288)	(0.287)		(0.315)	(0.317)
Age		0.008	0.010		-0.036***	-0.031***
		(0.009)	(0.009)		(0.009)	(0.010)
Education		-0.133	-0.117		0.189	0.205*
		(0.126)	(0.128)		(0.120)	(0.122)
Income		0.023	0.021		-0.055	-0.053
		(0.061)	(0.062)		(0.058)	(0.059)
Basic numeracy			-0.001			0.092
			(0.135)			(0.139)
Probability of Fire			0.004			
			(0.005)			
Probability of Flood						0.016**
						(0.006)
Probability of Train accident						

Is it new information or visceral reaction?

What do you believe are the probabilities of the following events happening in your greater region in the next 12 months? Consider 0% as definitely not happening and 100% as definitely happening.

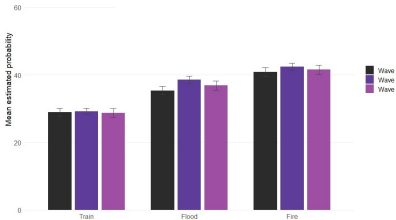


Is it new information or visceral reaction? - Greece



- Small-size effects for fires(more common event)
  - Pre-summer anticipation
- Large-size effects for floods (novel event) at first (Wave 3)
  - The effect gradually dissipates

Is there belief updating in the US?



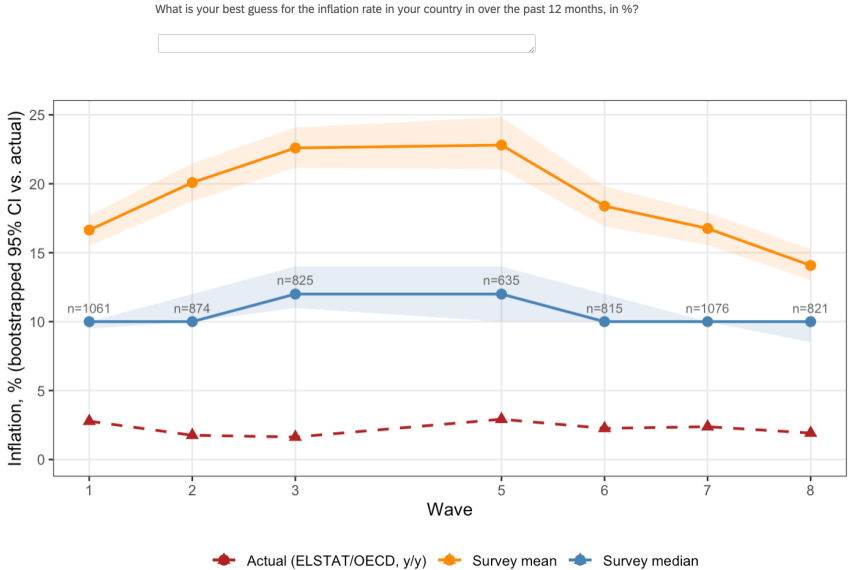
	ProbFire			ProbFlood		
Wave 2 (ref: Wave 1)	1.108	1.718	-7.102	1.118	1.802	6.472*
	(1.490)	(1.477)	(4.967)	(1.484)	(1.458)	(3.326)
Wave 3 (ref: Wave 1)	-0.704	-0.758	-9.618*	-2.369	-2.974*	-2.905*
	(1.676)	(1.667)	(5.490)	(1.650)	(1.625)	(1.626)
California (ref: New York)	11.538***	11.622***	3.816	-1.827	-1.562	-1.495
	(1.600)	(1.592)	(4.568)	(1.578)	(1.536)	(1.536)
Texas (ref: New York)	-1.668	-1.763	-5.823**	1.349	1.271	1.371
	(1.598)	(1.580)	(2.697)	(1.552)	(1.523)	(1.524)
Wave 2 x California	-0.939	-0.939	7.018	-2.852	-3.384*	-4.381**
	(2.093)	(2.094)	(4.765)	(2.068)	(2.032)	(2.117)
Wave 2 x Texas	2.330	1.643	5.601*	5.714***	7.746***	4.368
	(2.054)	(2.036)	(2.989)	(2.063)	(2.041)	(3.135)
Wave 3 x California	-0.026	0.476	8.520*	2.428	2.918	2.901
	(2.340)	(2.344)	(4.882)	(2.314)	(2.278)	(2.280)
Wave 3 x Texas	3.687	3.071	7.124**	6.476***	8.377***	8.302***
	(2.310)	(2.298)	(3.176)	(2.297)	(2.281)	(2.284)
Gender: Male (ref: Female)		-1.738**	-1.741**		-0.876	-0.774
		(0.720)	(0.724)		(0.713)	(0.716)
Age		-0.132***	-0.134***		-0.259***	-0.257***
		(0.022)	(0.022)		(0.021)	(0.021)
Education		-0.797***	-0.820***		-0.809***	-0.783***
		(0.285)	(0.285)		(0.282)	(0.283)
Income		-0.271*	-0.269*		-0.296**	-0.301**
		(0.141)	(0.142)		(0.141)	(0.141)
Basic numeracy			-0.124			0.265
			(0.324)			(0.323)
Distance to fire event (100 km)			-0.239*			
			(0.127)			
Distance to flood event (100 km)						-0.193
						(0.125)
Constant	37.516***	49.583***	58.929***	35.517***	53.372***	52.492***
	(1.157)	(1.960)	(5.192)	(1.118)	(1.922)	(2.146)
Observations	6199	6115	6107	6184	6100	6093
R-squared	0.035	0.046	0.047	0.031	0.058	0.059
Adjusted R-squared	0.034	0.045	0.045	0.029	0.056	0.056
Residual Std. Error	27.887	27.745	27.740	27.926	27.563	27.569

- No detectable overall change across the states
- Floods in Texas $\rightarrow$ higher posterior probability
- But not fires in California
- Distance matters
  - Consistent with Greece on more novel events
  - Persistence?

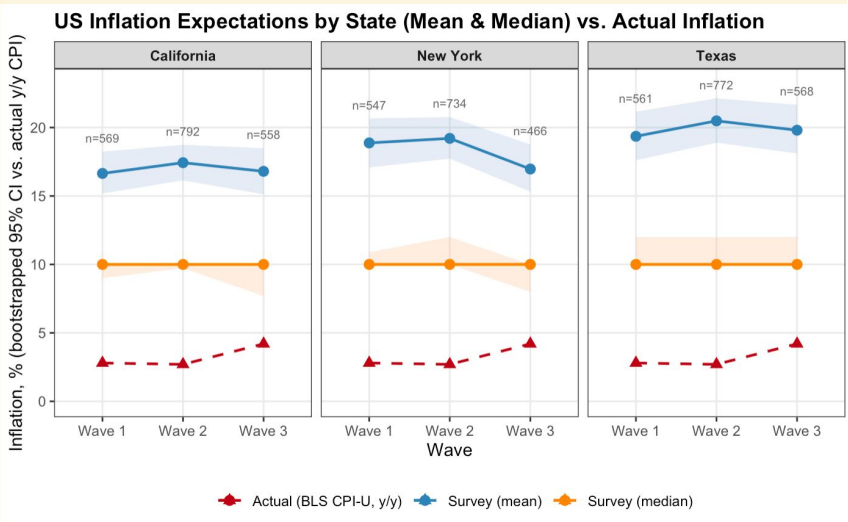
Inflation perceptions - Greece

What is your best guess for the inflation rate in your country in over the past 12 months, in %?

Inflation perceptions - Greece



Inflation perceptions - US

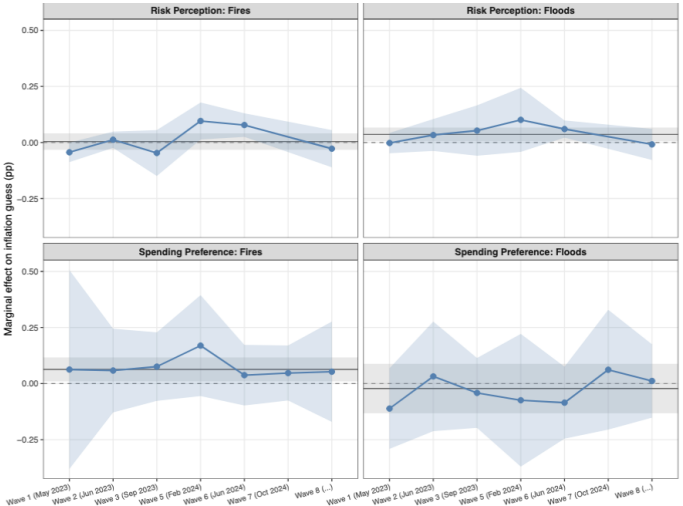


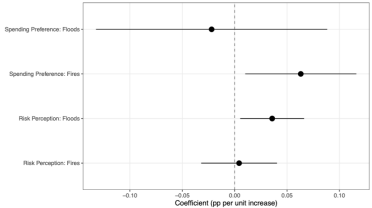
Do disaster perceptions link to inflation perception?



[0]Wave and NUTS2-region FE, weighted by NUTS3, SEs clustered at NUTS2 level.

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[0]Wave and NUTS2-region FE, weighted by NUTS3, SEs clustered at NUTS2 level.

Closer look at visceral reactions - primes

2018 Attica wildfires

Article Talk

From Wikipedia, the free encyclopedia

A series of wildfires in Greece, during the 2018 European heat wave, began in the coastal areas of Attica in July 2018.[4] 104 people were confirmed dead from the Mati fires.[1] The fires were, at that time, the second-deadliest wildfire event in the 21st century, after the 2009 Black Saturday bushfires in Australia that killed 173.

Over 700 residents were evacuated or rescued, mainly from the seaside

Do you think the Greek government of SY.RIZ.A was to blame for the fire accident in Mati, Athens?

Definitely not | Probably not | Might or Might not | Probably yes | Definitely yes

July 2025 Central Texas floods

Article Talk

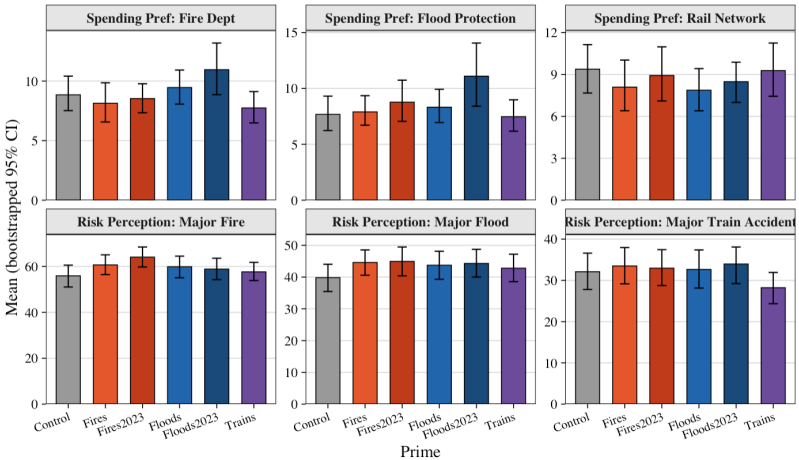
From Wikipedia, the free encyclopedia

On July 4, 2025, destructive and deadly flooding took place in the Hill Country region of the U.S. state of Texas. During the flooding, water levels along the Guadalupe River rose rapidly. As a result, at least 139[5] people were killed, at least 117 of them in Kerr County. The flooding was caused by a mesoscale convective vortex with enhanced tropical moisture.

Do you think the Biden administration was to blame for the damage caused by the 2023 train derailment in Ohio?

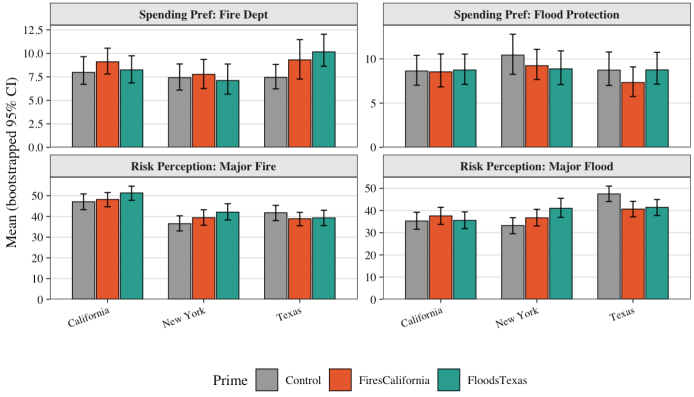
Definitely not | Probably not | Might or might not | Probably yes | Definitely yes

Spending Preferences and Risk Perceptions by Disaster Prime — Greece



- Resource allocation for more salient events (floods) - within domain
- Reminder of more salient event (flood) in the other domain (fires)

Spending Preferences and Risk Perceptions by Disaster Prime — US



- US citizens more consistent overall
- Possible small visceral response in Texas (across domains)

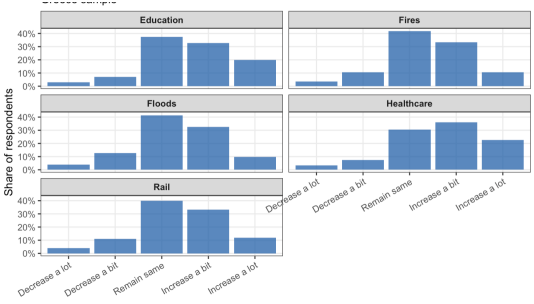
Anticipating own volatility/stability?

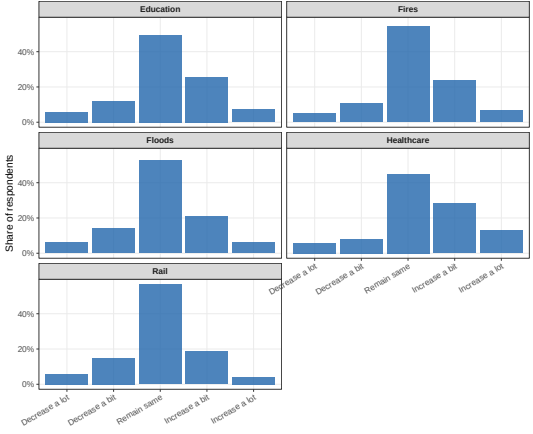
Do you think that you would **change** any of the above percentages of money you allocated to causes in some time, e.g. if asked again in **6 months from now**?

Note that the **total** budget would remain the **same**, so e.g. *increasing* allocation to one cause would mean the allocation to another would have to *decrease*.

	DECREASE a lot	DECREASE a bit	REMAIN same as now	INCREASE a bit	INCREASE a lot
Fire Department	○	○	○	○	○
Protection against floods and global warming	○	○	○	○	○
Rail transport network (including safety)	○	○	○	○	○
Healthcare system	○	○	○	○	○
Education	○	○	○	○	○

Anticipating own volatility/stability? Greece vs US



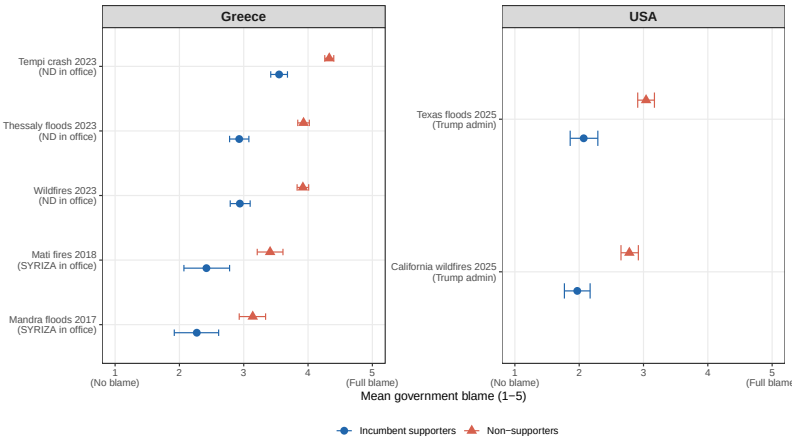


Judgement of blame

Do you think the [*administration at the time*] *was to blame for the* [*disaster event*] *in* [*location*]*?*

Judgement of blame

Do you think the [administration at the time] was to blame for the [disaster event] in [location]?



Points show means; horizontal bars show 95% confidence intervals.
Incumbent supporters defined as voters for the governing party at the time of the event.

Summary

- Exogenous shocks (fires, floods) shift public attitudes **in the affected domain**
  - More strongly in Greece than in the US
- Effects are **short-lived** and look more like salience than belief updating
  - Different for novel events
- Salience of event in one domain may affect attitudes in the other
  - Link with economic sentiment
  - Partisan blame gap

Discussion

- If preferences are this volatile, **whose preferences should guide policy** – hot-state (post-shock) or cold-state?
- Risk of **populist exploitation**: salience-driven spending demands can crowd out long-run priorities
- Objective risk/damage estimates should rely on science;
- What is difference between countries driven by? does the **US update less**
  - media environment?
  - polarization?
  - disaster frequency/habituation?

Thank you!

Questions and comments welcome