The Dynamics of Risk Perception for Soft Target Terrorism

17th September, 2018
PSAM-14, UCLA
M11: Risk Perception and Communication

Matt Baucum, Richard John
Center for Risk & Economic Analysis of Terrorism Risks (CREATE)
University of Southern California, Los Angeles, CA, U.S.A.

Marcus Mayorga, Paul Slovic,
Decision Research, Eugene, OR, U.S.A.
University of Oregon, Eugene, OR, U.S.A.

William Burns,
Decision Research, Eugene, OR, U.S.A.
Cal. State University, San Marcos, CA, U.S.A.

Kent Portney, & Jeryl Mumpower
Texas A&M University, College Station, TX, U.S.A.

Soft Target Terrorism (STT) Events prior to June, 2016

1. The mass shooting at the regional center facility in San Bernardino, California

2. The mass shooting at the Planned Parenthood Clinic in Colorado Springs, Colorado

3. The same day mass shootings and bombings at several locations, including a concert hall, café

4. and stadium, in Paris, France

5. The mass shooting at the church in Charleston, South Carolina

6. The mass shooting at the elementary school in Newtown, Connecticut

7. The Boston Marathon bombings

8. The bombings at several locations, including the airport and subway station, in Brussels, Belgium

Soft Target Terrorism (STT) 2016 Events

1. The mass shooting at the gay nightclub in Orlando, Florida

2. The attack by driving a large truck into a crowd of people in Nice, France

3. The shooting of police officers in Dallas, Texas

4. The shooting of police officers in Baton Rouge, Louisiana

5. The bombings and attempted bombings during the same weekend at several locations in New York City and New Jersey

Public Response to STT

Understanding of the public response to soft-target terrorism requires concrete knowledge of how individuals' thoughts, emotions, and behaviors influence each other in the risk perception process.

Research Question #1

- *How do measures of terrorism-related fear, likelihood estimates, and consequence estimates predict each other over time?*

Research Question #2

How do measures of terrorism-related fear, likelihood, estimates, and consequences estimates predict risk perceptions over time?

Research Question #3

To what degree are the impacts of likelihood and consequence estimates on risk perceptions and behavior mediated by affect?

Research Question #4

To what degree do each of the risk-related variables impact future risk-reducing behaviors, and to what degree to such behaviors influence later values of those same variables?

Research Question #5

How do each of the aforementioned risk-related variables change in response to highly publicized terror attacks?

Survey Panel

- Representative Quota Sample
- Panel consisting of 1669 members (age 18 or older, fluent in English) from the United States and Canada
- Selected N=700 who agreed to participate in study

Waves 1 month apart in 2016

- June 10-16 (Wave 1),
- July 11-18 (Wave 2),
- August 10-17 (Wave 3),
- September 11-20 (Wave 4),
- October 11-20 (Wave 5), and
- November 10-21 (Wave 6)

Sample Attrition over 6 months

- Data collection took place over six waves spaced approximately one month apart, with the number of participants at each wave as follows:
- n_{wave1}=700,
- n_{wave2}=664,
- n_{wave3}=646,
- n_{wave4}=624,
- n_{wave5}=606,
- n_{wave6}=711

US only Sample Complete Data

- We use data from participants with complete responses to all items of interest at all six waves, for a final sample of n=496 (63.9% female)

- Education:
  - 98.8% graduated high school,
  - 76.6% had some college or vocational training,
  - 48.2% graduated college, and
  - 14.7% had attained post-graduate education.

- Median age of the sample was 44 (IQR=19)

Soft Target Terror Events

- 1) Involved the killing or attempted killing of multiple people,

- 2) Was highly publicized in the United States (given our use of a U.S.-based sample), and

- 3) Occurred during one of the waves of data collection

Four STT Events during data collection

- Nightclub shooting in Orlando, FL that killed 49 people (June 11, during wave 1),

- Truck attack in Nice, France that killed 86 people (July 14, during wave 2),

- Shooting that killed three police officers in Baton Rouge, LA (July 17, during wave 2), and

- Detonation of multiple bombs in New York, NY that injured 31 (September 17, during wave 4)
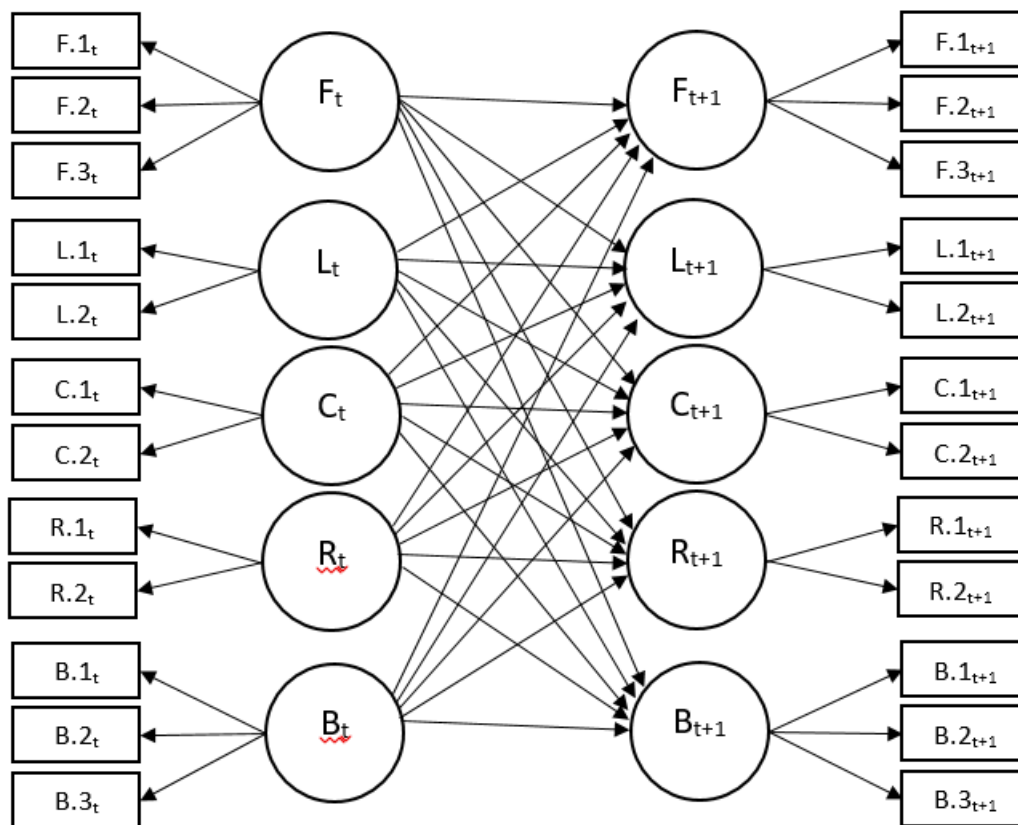
Timing of Highly-Publicized Shootings and Terror Attacks During Data Collection
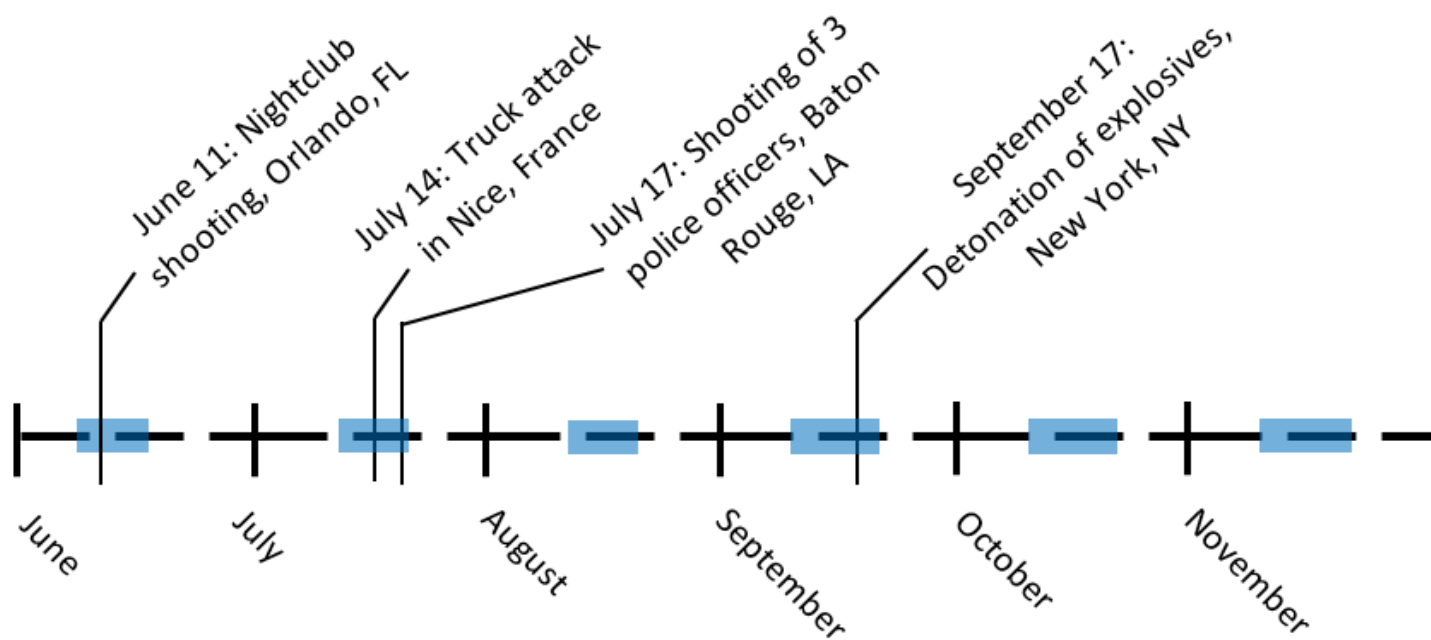
PLS model setup for adjacent waves *t* and *t+1*

(Note: L=Likelihood estimates. C=Consequence estimates. R=Risk estimates. F=Fear/anxiety ratings. B=Risk-reducing behavior ratings)

Descriptive Statistics for Raw Scale Scores Across All Waves

Construct (Range)	Value	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6
Fear (3-12)	Mean	7.56	7.76	7.64	7.44	7.45	7.45
	SD	2.57	2.59	2.54	2.61	2.58	2.60
	α	0.92	0.92	0.88	0.90	0.90	0.90
Likelihood (2-8)	Mean	5.31	5.69	5.30	5.25	5.40	5.26
	SD	1.59	1.51	1.59	1.59	1.53	1.60
	α	0.76	0.71	0.74	0.78	0.80	0.83
Consequence (2-8)	Mean	6.46	6.56	6.34	6.21	6.08	5.96
	SD	1.44	1.41	1.45	1.49	1.46	1.49
	α	0.83	0.82	0.81	0.83	0.79	0.82
Risk (2-8)	Mean	6.59	6.90	6.63	6.43	6.58	6.42
	SD	1.96	1.95	1.88	1.89	1.85	1.92
	α	0.83	0.86	0.84	0.84	0.82	0.85
Behaviors (0-3)	Mean	0.49	0.52	0.53	0.49	0.49	0.45
	SD	0.88	0.91	0.92	0.87	0.90	0.88
	α	0.70	0.68	0.69	0.68	0.70	0.77

Lagged Model Coefficients For Consequence, Likelihood, and Fear Across All Waves (Note: *p<0.05)

Previous Wave	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6
			Fear		
Fear	0.640*	0.684*	0.644*	0.679*	0.694*
Likelihood	0.062	0.050	0.085	-0.016	0.086*
Consequences	0.043	0.032	0.053	0.096*	0.052
			Likelihood		
Fear	0.034	0.110	0.105*	0.105*	0.152*
Likelihood	0.426*	0.326*	0.396*	0.514*	0.426*
Consequences	0.022	0.00	0.056	0.000	0.026
			Consequences		
Fear	0.070	0.075	0.140*	0.064	0.125*
Likelihood	-0.004	0.056	0.053	-0.074	0.012
Consequences	0.440*	0.390*	0.489*	0.556*	0.558*

Lagged Effects Between Risk Perception and Risk-Related Variables Across All Waves (Note: *p<0.05)

Previous Wave	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6
		Risk Perceptions			
Fear	0.042	0.224*	0.137*	0.085*	0.169*
Likelihood	0.271*	0.243*	0.136*	0.234*	0.192*
Consequences	0.097*	0.138*	0.209*	0.116*	0.094*
		Fear			
Risk	0.022	0.059	0.012	0.072	0.010
		Likelihood			
Risk	0.165*	0.234*	0.151*	0.161*	0.230*
		Consequences			
Risk	0.131	0.173*	0.075	0.131*	0.083

Lagged Effects Between Behavior and Other Constructs Across All Waves (Note: *p<0.05)

Previous Wave	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6
			Behavior		
Fear	0.166*	0.117*	0.154*	0.059	0.168*
Likelihood	0.074	0.003	0.079	0.043	0.000
Consequences	-0.092*	-0.026	-0.009	-0.008	-0.039
Risk Perceptions	0.022	0.065	-0.043	0.002	0.040
			Fear		
Behavior	0.093*	0.057	0.117*	0.103*	0.088*
			Likelihood		
Behavior	0.015	0.110*	0.082	-0.054	0.000
			Consequences		
Behavior	-0.011	-0.059	-0.030	-0.021	-0.094*
			Risk Perceptions		
Behavior	0.070	0.068*	0.104*	0.005	-0.033

Research Question #1

How do measures of terrorism-related fear, likelihood estimates, and consequence estimates predict each other over time?

- *Autocorrelations high for behavioural data*

- *Largely stable over time*

- *Affect more stable than likelihood and consequence estimates*
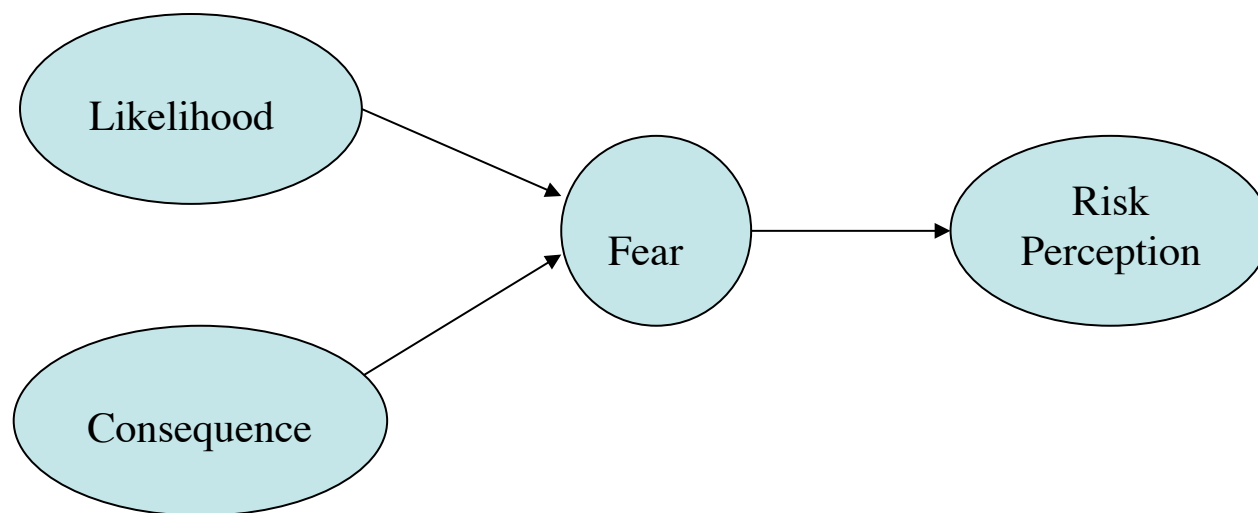
Research Question #2

How do measures of terrorism-related fear, likelihood, estimates, and consequences estimates predict risk perceptions over time?

- *Fear and estimates of Likelihood and Consequences at tie t all independently predict Risk Perception at time t+1*
- *Risk Perception at time t does not predict fear at time t+1*
- *Risk Perception at time t does moderately predict estimates of Likelihood and Consequences*

Research Question #3

To what degree are the impacts of likelihood and consequence estimates on risk perceptions and behavior mediated by affect?

- *Fear is a weak mediator due to low predictability of fear at time t from Likelihood and Consequence at time t-1*

Likelihood → Fear → Risk Perception

Consequence → Fear

Research Question #4

To what degree do each of the risk-related variables impact future risk-reducing behaviors, and to what degree to such behaviors influence later values of those same variables?

- Behavior at time t predicted *ONLY* by Fear at time t-1
- Fear *ONLY* at time t somewhat weakly predicted by Behavior at time t-1

Research Question #5

How do each of the aforementioned risk-related variables change in response to highly publicized terror attacks?

- Lagged relationships robust over 5 lagged time periods with great variation in soft target terror events

- Lagged relationships do not change with media reporting of soft target terror events

Summary

- Beliefs and Affect stable over time
- Risk Perception predicted independently from both Beliefs and Affect
- Affect does not mediate the relationship between Beliefs and Risk Perception
- Behavior is largely determined by Fear and not Beliefs about Likelihood or Consequence
- Relationships are robust to media reporting of soft target terror events.

The Dynamics of Risk Perception for Soft Target Terrorism

17th September, 2018
PSAM-14, UCLA
M11: Risk Perception and Communication

Matt Baucum, Richard John

Center for Risk & Economic Analysis of Terrorism Risks (CREATE)
University of Southern California, Los Angeles, CA, U.S.A.

Marcus Mayorga, Paul Slovic,

Decision Research, Eugene, OR, U.S.A.
University of Oregon, Eugene, OR, U.S.A.

William Burns,

Decision Research, Eugene, OR, U.S.A.
Cal. State University, San Marcos, CA, U.S.A.

Kent Portney, & Jeryl Mumpower

Texas A&M University, College Station, TX, U.S.A.