Memories and Decision-making: Determining Action when the Sirens Sound

Instruments and Data

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Abstract

Memory's role in risk situations is pivotal to determining potential outcomes. Specifically, semantic and episodic memories play an important role in an individual's decision-making under risk. These memories, as well as social, demographic and policy variables form the basis of planned action. Semantic knowledge is information about the world, learned through reading, media, schooling, and other secondary experiences. Episodic memories are actual life experiences, and are often connected to specific affective imagery associated with our experience. In this study, students were faced with a decision-making task both before and after viewing a 5-minute slide show of tornadoes and related damage. Forty-nine undergraduate students participated in this one-hour, cognitively based experiment focusing on decisionmaking during a regularly scheduled class. The experimental population averaged 22 years in age, were exclusively non-science majors, both male (n=21) and female (n=28) at varying academic ranks, and contained n=23 who reported having personally experienced a tornado Before viewing the slide show, those students with episodic experiences exhibited marginally higher tendency to react to a tornado warning than those students with only semantic knowledge. Viewing of the slide show resulted in movement of both semantic and episodic groups towards more prudent decision-making, with the semantic group exhibiting the largest gain. In addition to the import of episodic and semantic memories on decision-making, the role of the affect, anchoring, and the availability heuristic are also considered. Integrating past experiences and information in decision-making can provide new avenues for development of warnings intended to induce caution

Research Question

What roles do episodic and semantic memories play in decisionmaking under risk?

Episodic: Experienced life events

Semantic: Learned knowledge of the world

Risk in this study: Tornado warnings

Research Methods

THE PARTICIPANTS

Forty-nine (N=49) undergraduate MSU students participated in a one-hour cognitively based experiment focusing on decision-making during a regularly scheduled physical science course for non-science majors.

THE EXPERIMENT

Two guestionnaires were administered to gauge the participants level of semantic and episodic weather experiences. A decision-making questionnaire was then administered in asking participants "What would you do if a tornado warning was issued?"

Experimental Timing and Intervention:

A 6 minute presentation featuring tornadic events and resulting disasters was then administered, followed immediately by the completion of a second decision-making questionnaire







Important Data

	Warning	Event	Tornado
% of participants	88%	84%	47%
# of experiences	3.4 per year	31.0 lifetime	1.4 lifetime

Source of weather information



Tornado emergency plans Open-Ended Question Student Response What would you do if you couldn't get home to Get safe and contact them I ook for low your family or friends? ground. Go to a hotel. Hide under a bridge Call and get my dog Do you have an emergency plan in place? Sort of. I will now. No. none whatsoever Maybe. Yes I do



Factor Name	Factor Loading	DM1 Questions
Active	.425	Listen to NOAA weather radio or other commercial radio/tv broadcast
Active	.378	Look for approaching storms or danger signs
Active	.461	Depend on friends/family for storm information
Active	.725	Gather personal belongings/pets before seeking shelter
		Seek appropriate shelter immediately
Passive	.901	Ignore warning since you see no apparent danger
Passive	.923	Ignore warning since you assume you are safe in your current location
Passive	.934	Ignore warning since there is a small chance that you will be hit by a tornado
Passive	.687	Wait for sirens to sound before seeking shelter
		Attempt to out run the tornado if you are in your car

Conclusions and Future Directions

- Only 63% understand a warning is the most urgent NWS statement during a severe event
- Potential for cognitive impact through visual intervention for warnings.
- Higher level of semantic information positively impacts adherence/action to warnings.
- Previous episodic experiences positively impact adherence/action to warnings (greater impact for semantic).

Future Directions

These results are considered attributable to knowledge, cognitive, social and demographic factors that substantiate the need for further research using refined methods and more diverse participants. Ultimately, we must ensure that the public hears and heads severe weather warnings in order to protect the life and property of those impacted.

Acknowledgements & References

This work was completed while in residence at the Geocognition Research Laboratory at Michigan State University. I thank Emily Geraghty Ward and Julie Libarkin for assistance with this paper, as well as all students who graciously participated in this research

Funding for participation in The American Meteorological Societies Conference on Weather Warnings and Communication was wa partially provided by Michigan State University's Environmental Science and Policy Program (ESPP).

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