

Turning Up the Heat on Parents of Young Children: Communicating the Risk of Pediatric Vehicle-Related Hyperthermia

Introduction:

In the United States alone, nearly 40 young children die every year due to pediatric vehicle-related hyperthermia^{1,2,3,4,5,8}. Young children are more at risk for vehicle hyperthermia because they cannot regulate their core temperature and sweat less than the average adult¹. This health issue was relatively prevalent in the news media during the summer of 2014, with many tragic cases occurring across the United States and abroad. Several researchers have examined pediatric vehicle-related hyperthermia, but a gap in the literature exists with respect to communicating this risk to parents^{2,3,4}. Guard & Gallagher (2005) note that addressing vehicle-related hyperthermia is a multifaceted problem that revolves around education and legislation. My primary focus is education and the need for campaigns that deliver more effective messages to the targeted populations, for example, caregivers and parents^{2,4}. While many public service announcements (PSAs) and state campaigns have been undertaken in recent years, rigorous studies have yet to be completed evaluating these campaigns on their ability to both raise awareness and increase risk perception. To effectively target messages to the most relevant parent audience, a focus needs to be placed on parents of children five years of age and younger. A variety of health communication theoretical frameworks can aid in understanding and modifying parents' behavior when it comes to perceiving vehicle hyperthermia as a potential risk⁵. A common health communication framework to predict health-risk behaviors, is the Health Belief Model. The Health Belief Model is known for its use in the adoption and maintenance of behaviors involving both health prevention and promotion⁶. In order to encourage pediatric injury prevention among parents with young children, it is essential that education and communication increase parents' awareness of the risks, dangers, and change their perceptions regarding the likelihood and severity of vehicle-related hyperthermia.

Research Questions:

1. What current knowledge do parents, who have children 5 years and younger, possess in regards to the danger vehicle hyperthermia poses to children and safety measures for injury prevention?
2. What is the most effective messaging strategy (e.g. scientific vs. emotional) to communicate the risk, alter the risk perception, and change the behaviors of parents (e.g. following recommendations to prevent pediatric vehicle-related hyperthermia)?

Methods:

To identify potentially effective messages and communication strategies, when it comes to parents of children five years old and younger, a mental model approach to risk communication will be implemented. The mental model approach consists of interviews with experts and parents, a baseline questionnaire, message construction, and a final message experiment⁷. (1) Initially, I will interview parents from the Athens-Clarke county community to determine their current knowledge, beliefs, and deficiencies in their understanding of vehicle hyperthermia. (2) After conducting several interviews with parents and experts, I will create a questionnaire using the information received from those interviews to sample a wider audience of parents across the southern United States. The questionnaire will be used as the control group during the message experiment and will generally consist of: parents' risk perceptions, measures of prevention, motivation and intention of adopting specific preventative measures, and demographics of the sample (*Question 1*). (3) Two experimental groups will be created in order to test the effects and effectiveness of two different approaches to prevention messages on the

knowledge, beliefs, and intentions of parents in relation to vehicle-related hyperthermia. Based on preliminary parent and expert interviews, the nature of the messaging could include a scientific approach or an emotional approach, each of which will demonstrate a separate health communication theoretical framework. Prior to the message experiment, a base-knowledge questionnaire will be given to the participants in the experimental groups in order to understand their initial thoughts on the subject matter. Other questions regarding child vaccination will be provided to mask the intent of the study. (4) During the message experiment, individuals will be assigned to one of the two experimental groups, in which the designated message will appear in brochure format and be mixed in with other messages on child vaccination. (5) After reading the materials, the experimental groups will be given a similar questionnaire in order to assess their understanding of the risks and preventive measures of pediatric vehicle-related hyperthermia. The questionnaire results between the experimental and control groups can then be compared in order to determine which message was the most successful in altering the perception of risk and intention of adopting preventive steps on the subject of vehicle-related hyperthermia (*Question 2*).

Some limitations and weaknesses exist throughout this experimentation process.

Although I plan to conduct a survey with a random sample of parents of children five years old and younger in selected southern states, a *completely* generalizable sample will not be met. A sample of the southern states was chosen due to the high volume of pediatric vehicle-related deaths that have occurred in this region⁸. A better understanding of the current knowledge involving pediatric hyperthermia would be better achieved using a nationwide sample of parents.

Broader Impacts/Intellectual Merit:

With my interdisciplinary background, involving the fields of risk communication, psychology, and climatology, I can successfully implement this project and impact society by potentially increasing our understanding of how parents' perceive vehicle hyperthermia. Using the expertise of my well-rounded committee members at the University of Georgia, we developed a multi-method approach that has the potential to create a new subfield examining risk communication efforts in the atmospheric sciences. Developing a sound communication strategy for vehicle hyperthermia is a positive step toward preventing future pediatric injury^{2,4}. It is my hope that this project can develop and implement an evidence-based method for communicating the risk of vehicle hyperthermia to parents. Using the results of the study, I aspire to use this empirically-based method of communication to further develop messaging strategies for other heat-related and natural hazards.

¹ Duzinski, S. V., Barczyk, A. N., Wheeler, T. C., Iyer, S. S., & Lawson, K. A. (2013). Threat of paediatric hyperthermia in an enclosed vehicle: a year-round study. *Injury prevention*, injuryprev-2013

² Grundstein, A., Null, J., & Meentemeyer, V. (2011). Weather, geography, and vehicle-related hyperthermia in children. *Geographical review*, 101(3), 353-370.

³ Grundstein, A., Dowd, J., & Meentemeyer, V. (2010). Quantifying the heat-related hazard for children in motor vehicles. *Bulletin of the American Meteorological Society*, 91(9), 1183-1191.

⁴ Guard, A., & Gallagher, S. S. (2005). Heat related deaths to young children in parked cars: an analysis of 171 fatalities in the United States, 1995–2002. *Injury Prevention*, 11(1), 33-37.

⁵ Toolo, G., FitzGerald, G., Aitken, P., Verrall, K., & Tong, S. (2013). Are heat warning systems effective?. *Environmental Health*, 12(27)

⁶ Richard, L., Kosatsky, T., & Renouf, A. (2011). Correlates of hot day air-conditioning use among middle-aged and older adults with chronic heart and lung diseases: the role of health beliefs and cues to action. *Health education research*, 26(1).

⁷ Morgan, M. G. (Ed.). (2002). *Risk communication: A mental models approach*. Cambridge University Press.

⁸ Null, J. (Updated: 2014, October 16). Heatstroke Deaths of Children in Vehicles. Retrieved September 8, 2014, from <http://www.ggweather.com/heat/>