Pediatric Vehicular Heatstroke: Cognitive Errors Leading to Deaths in Hot Cars

NUARC

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Главная › Новости

В Атырау мать оставила годовалого ребенка на жаре в машине: малыш едва не задохнулся

Медики спасли жизнь ребенка, оказав ему экстренную помощь.

Марина Рузматова — Фото: Пресс-службу Управления здравоохранения западного региона — 667

В Атырау мать оставила своего годовалого малыша в запертой машине, где он едва не задохнулся. К моменту приезда медиков ребенок находился в бессознательном состоянии, с высокой температурой и судорожным синдромом. Благодаря оперативным действиям врачей, жизнь малыша удалось спасти, сообщает El.kz со ссылкой на пресс-службу Управления здравоохранения западного региона.

INTRODUCTION

- Every year, in Kazakhstan, and neighboring regions, children die from being accidently left in vehicles.
- Fatal heatstroke, involving widespread hemorrhaging, including the lungs, may occur when body temperature > 40°C [1].
- If parked in sunlight, temperatures within cars can reach 25°C higher than the ambient temperature [2], thus heatstroke can occur even on quite cool days.
- National statistics for most countries are not available. There are >4 fatalities reported each year in Chinese media, and around 38 each year in USA media [3]. The true incidence is likely higher.
- The cognitive mistakes that lead to these catastrophic events are not known.

METHODS

- As most cases of fatal vehicular heatstroke are described in the media of the USA, we studied all cases in the USA reported on news websites between 2019 and 2023.
- Data were recorded on details of the adults involved, the deceased, and the journey.
- We used cognitive science theories on action organization to categorize the different incidents.
- 166 separate fatal vehicular heatstroke incidents involving babies or children were identified.
- Multiple news sources for each incident were consulted.
- Three different raters analyzed the reports and agreed on data recorded and type of cognitive error that occurred.

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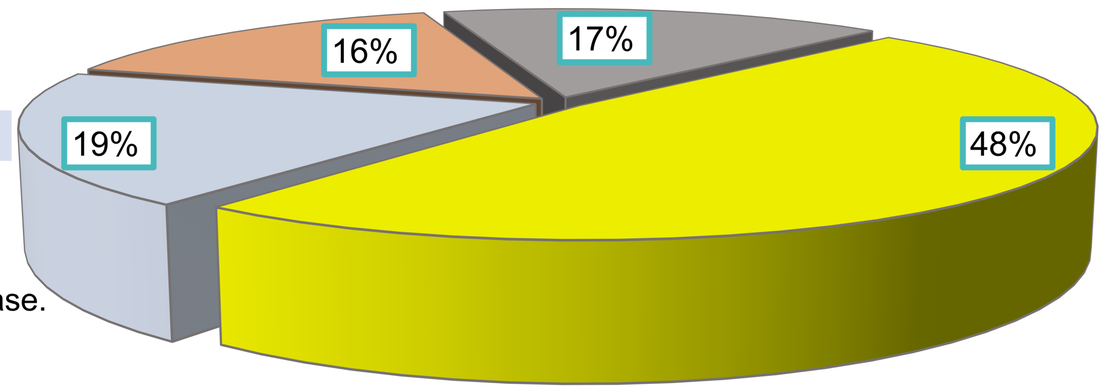
CLINICAL COGNITIVE SCIENCES LAB

ANALYSIS: CIRCUMSTANCES OF ALL 166 FATAL INCIDENTS

Gained Access
Children entered parked vehicles unsupervised, and became trapped.

Intentionally Left
Children deliberately left in the vehicle as planned. Adults did not realize the danger, or were reckless.



Unclear
Insufficient available information about the case.

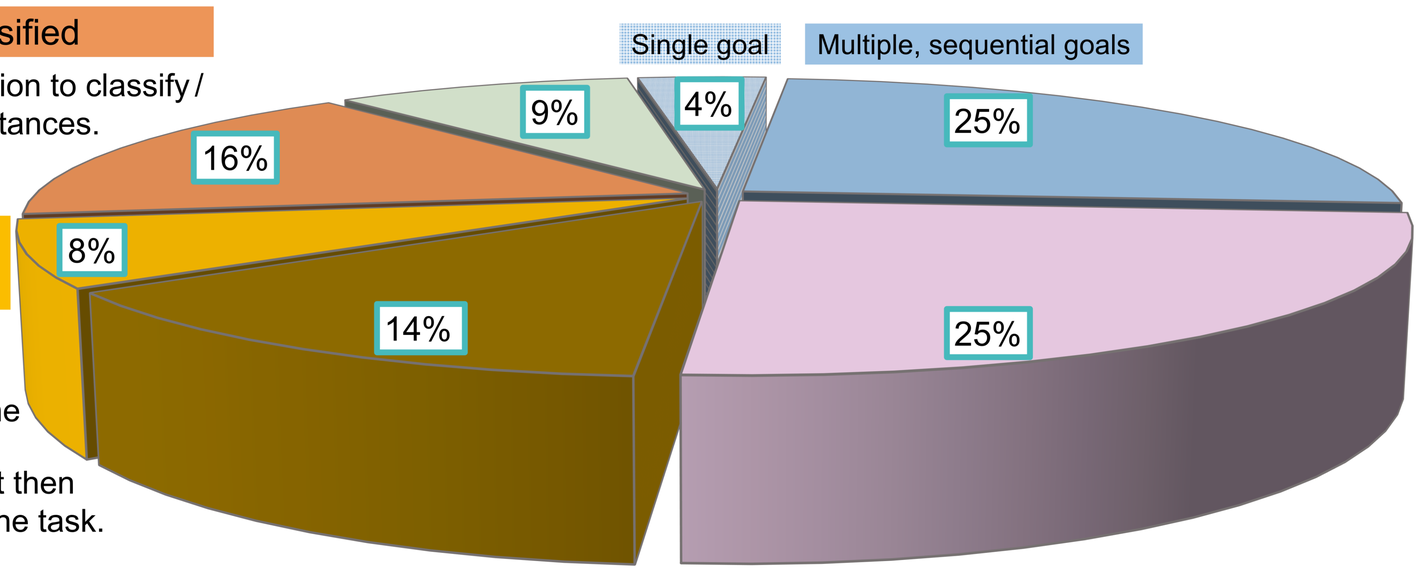
Cognitive Error
Children accidently left in the vehicle by caregivers. These errors are broken down in the figure below.

ANALYSIS: CATEGORIZATION OF THE 80 COGNITIVE ERRORS MADE

Routine Capture
The driver seemed to accidently follow a familiar routine (such as driving to work) because of habit. This is the classic behavioral organization error type described by the psychologist James Reason, from his diary studies of everyday action slips [4].

Goal Neglect
The driver made a plan but left out the step in which children were dropped off. These are consistent with errors seen in the lab experiments and neuro-psychological studies of Duncan et al [5]. These are plan implementation errors, associated with complex tasks.

Not Classified
Insufficient information to classify / ambiguous circumstances.



Non-completion of Sub-goal
A novel, error type, difficult to explain. The carer started the removal of children from the vehicle but then failed to complete the task.

Assumption Error
The people responsible for the children incorrectly assumed that somebody else had removed them from the vehicle. This was an unexpected error type, involving the failure of social communication. Similar errors are known in the aviation industry, which use 'sterile cockpit' rules to prevent them, such as one pilot always telling the other when they are 'in control'.

Post-completion Error
The journey was completed, but not the final step. This is consistent with the procedural working-memory errors noted in experiments of Byrne & Bovair [6]. Post-completion errors have been reported in several industrial accidents. They occur when the *main goal* (e.g., arrival at destination) is achieved *before* a subgoal (e.g., remove the child).

CONCLUSIONS

- Vehicular heatstroke resulting in fatalities is relatively rare, but an extremely serious public health problem.
- About half of all cases are caused by cognitive errors, the characteristics of which have not been previously described.
- We show that the features of the incidents are not inexplicable, but match closely onto several well-documented phenomena from cognitive science.
- In particular, the goal-neglect theory of frontal-lobe function and fluid intelligence [5], and the concept of post-completion working memory errors [6] together explain more than half of all the cognitive errors made.
- Understanding the catastrophic errors made may allow for better understanding of the causes, and potential prevention strategies, of fatal vehicular heatstroke.

Sustainable Development Goal

3 GOOD HEALTH AND WELL-BEING

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