INTRODUCTION

Background:
Misuse of CRS is very common and can have serious consequences on occupant safety. Physical incompatibilities between CRS and vehicles could be an underlying source of installation problems and misuse.

Project Goals:
- Collect dimensional data on a large group of late model CRS and vehicles.
- Compare the physical aspects which affect fit and compatibility.
- Determine which specific fit issues occur most often.

METHODS

A total of 59 CRS and 61 vehicles were analyzed for this study. Comprehensive dimensional data was collected from each product and compared across groups.

The 3,599 theoretical combinations of CRS and vehicle pairs were analyzed in several specific aspects of compatibility.

The “success rate” is displayed for each fit criterion. The success rate is the number of successful combinations as a percentage of the examined group.

RESULTS

The results indicate that both rear-facing and forward-facing CRS often do not fit between the vehicle seat’s side bolsters (red). Rear-facing CRS tend to have issues fitting into the clearance space allowed behind the front row vehicle seat (gray and black), and also have poor compatibility with the vehicle seat pan angle (purple). Forward-facing CRS often interact with the vehicle head restraint (brown).

DISCUSSION

The results of this study have many applicable uses in the child passenger safety field:

- The most frequently occurring fit problems have been identified and can be further addressed according to proper priority.
- Manufacturers can use the database of raw dimensional data as a benchmark or reference tool for design decisions.
- Consumers can be advised to double check two or three of the most common incompatibilities while making purchasing decisions.

Future work: Identify how these compatibility issues may or may not affect the performance of the CRS and the safety of the occupant.

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