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The effect of operators' briefing, cabin configuration and operating handle mechanism on Type III exit operation

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Acknowledgements

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- **The views expressed here are solely those of the authors.**

Background

- **Difficulties have been documented by Type III exit operators relating to the:**
  - **Cognitive demands – i.e. how to perform the task**
  - **Physical demands – i.e. physical parameters of hatch**

Background

- **Previous research has explored:**
  - **Adapting the operator to the task:**
    - **Provision of safety information**
    - **Presence of cabin crew in exit vicinity**
  - **Adapting the task to the operator**
    - **Access to the exit**
    - **Hatch weight**
    - **Changes to the exit mechanism**

Background

- **Majority of research into Type III exit operation has been conducted in a 3 x 3 seating configuration.**

- **Relatively little is known about whether the research findings generalise to a 2 x 2 configuration.**

Aim of research

- **To investigate the potential influence of:**
  - **Seating configuration**
  - **A minor modification to the operating handle mechanism**
  - **Exit operator briefing**

on Type III exit operation.

Test facility

- **Boeing 737 cabin simulator was used.**
- **Operational Type III exit in the starboard side of the cabin.**

IV 1:
Cabin configuration

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3 x 3

2 x 2

IV 2: Operating handle mechanism

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Retracted

Fixed

IV 3: Operator briefing

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Minimal

- Highlighted sat next to emergency exit
- May be required to open exit
- Location of further safety information

In-depth

- Instructions on physical actions to open exit
  - Where to release/ support hatch
  - Not hinged
  - Heavy
  - Correct disposal
  - Location of further information

Dependent variables

- **Main DV of interest was exit operation time.**

- **Split into:**
  - **Reaction time: call to evacuate until hand placed on the operating handle.**

  - **Operation time: hand placed on the operating handle until the exit was available for egress.**

Participants

- **80 volunteers each completed two trials.**
- **Each participant tested individually.**

- **A mixed experimental design was used:**
  - **two independent variables**
  - **one repeated measures variable.**

- **For safety and insurance provision, age and health criteria were in place.**

Experimental Design

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	Exit operator briefing			
	Minimal		In-depth	
Seating Configuration	Operating handle mechanism			
	Retracted	Fixed	Retracted	Fixed
3 x 3	20 trials	20 trials	20 trials	20 trials
2 x 2	20 trials	20 trials	20 trials	20 trials

Procedure

- **Participants were greeted by “cabin crew”.**
- **Check-in procedure: information on trials, medical questionnaire, providing informed consent and a pre-trial briefing.**
- **Participants boarded the cabin simulator.**
- **Sat adjacent to the Type III exit.**
- **A typical pre-flight safety briefing was provided, followed by exit operator’s briefing.**

Evacuations

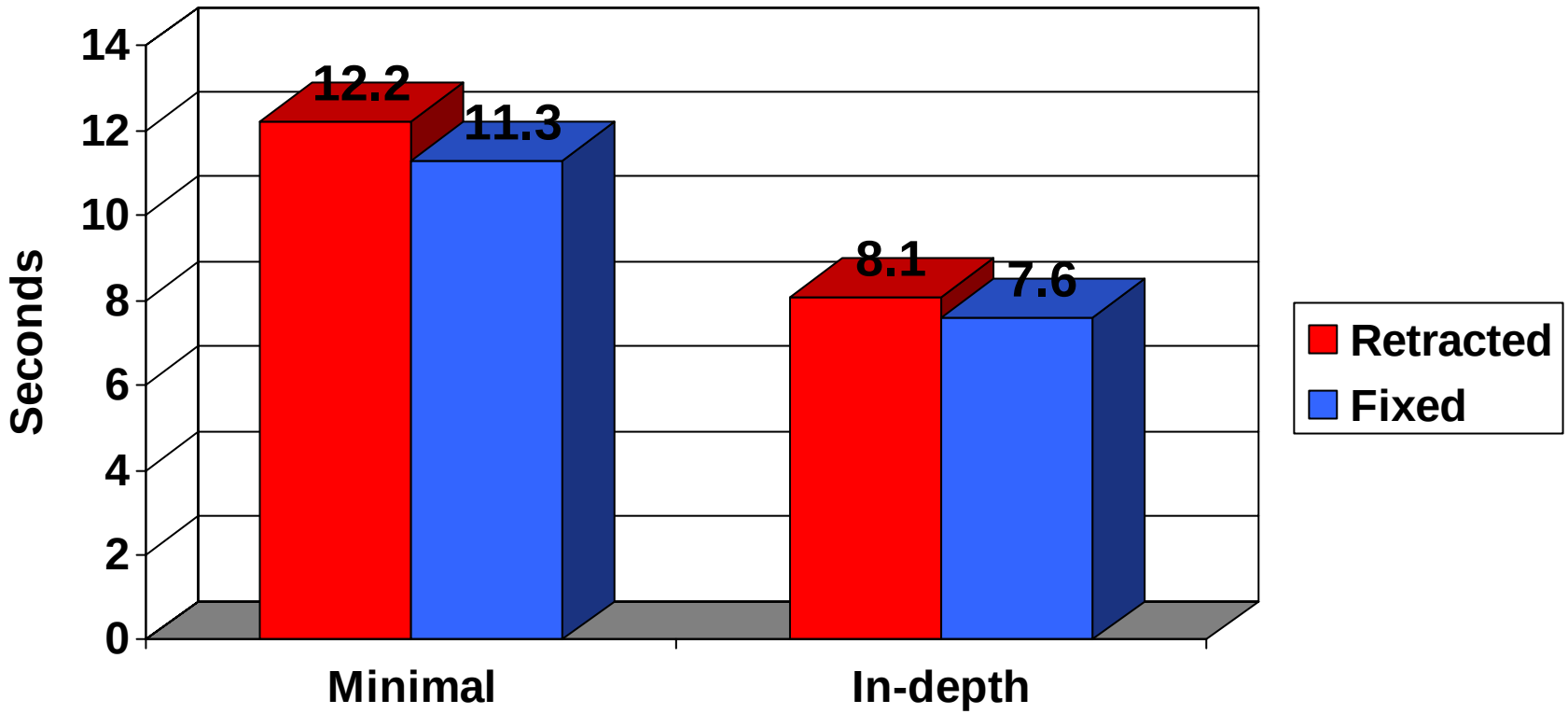
- **A recording of engine noise played, followed by Captain's command to "Undo your seatbelts and get out!"**

- **Cabin crew issued assertive, positive and concise commands (Muir & Cobbett, 1996).**

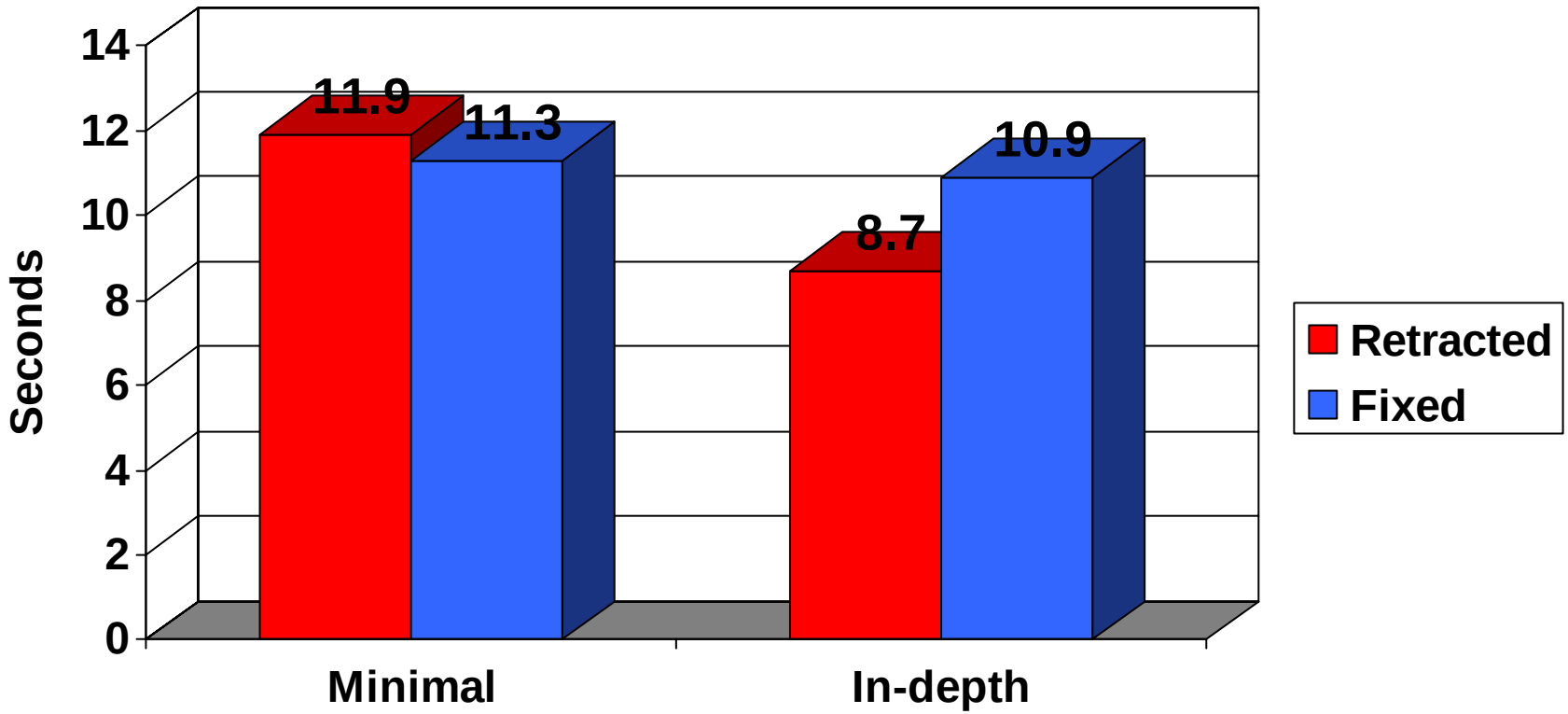
Results

- **The time for each participant to operate the exit was extracted from video footage recorded inside the cabin and outside the exit.**
- **All evacuations were successfully completed.**
- **Data were available from a total of 160 evacuations.**

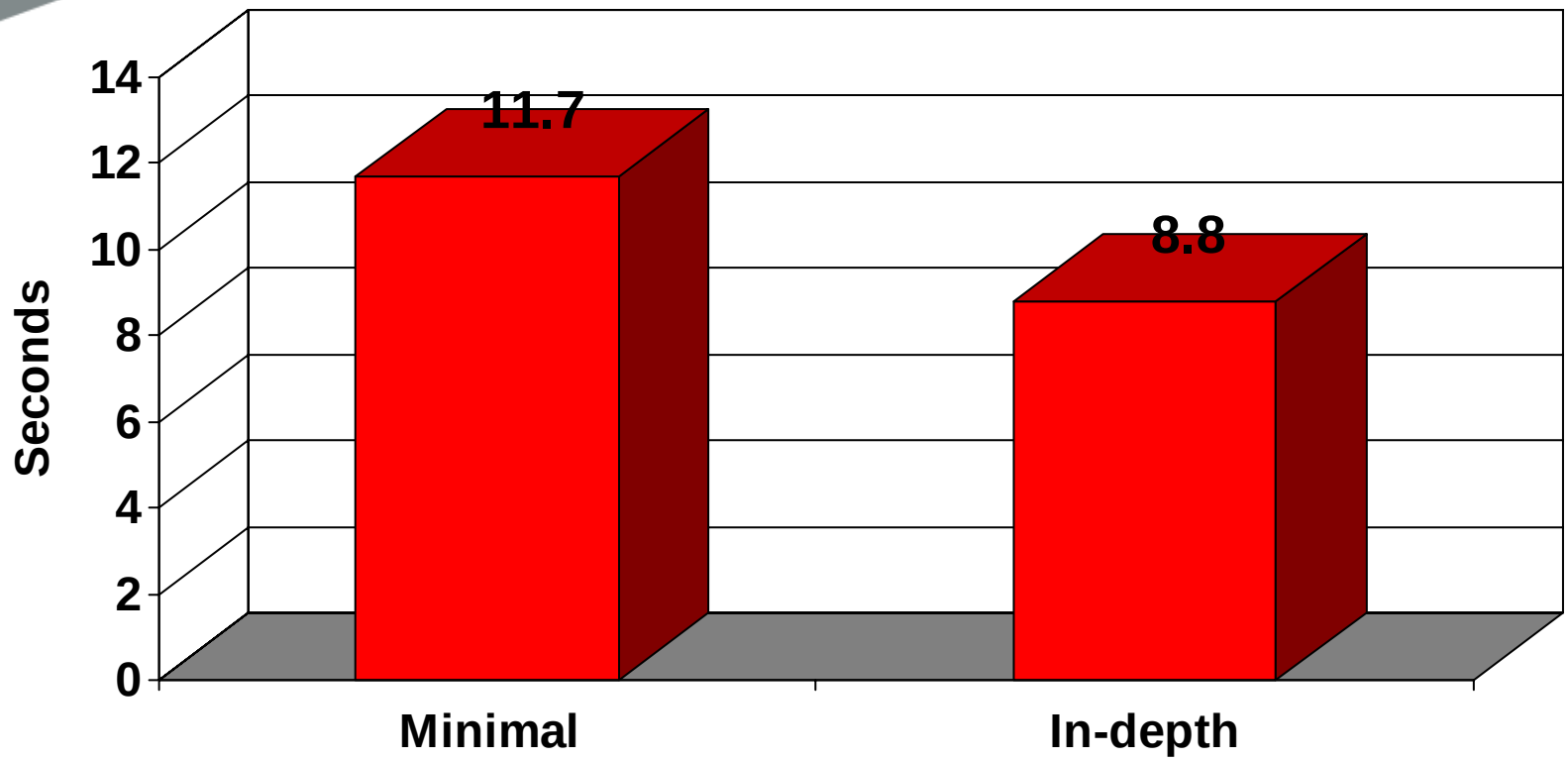
Exit operation: 3 x 3



Exit operation: 2 x 2



Exit operation: operator briefing



Exit operation: inferential statistics

- **In-depth briefing: participants were significantly faster in the time taken:**
  - **to react to the call to evacuate**
  - **to operate the exit**

- **No significant effects on exit operation attributable to operating handle mechanism or seating configuration.**

Conclusions

- **Results relate to preliminary experimental work.**
- **Raise interesting issues regarding Type III exits and safety briefings.**

- **This result highlights the importance of providing clear instruction to participants prior to them being asked to complete a complex task such as Type III exit operation.**

Conclusions

- **Further investigation into briefings is recommended:**
  - **Different types of briefing**
  - **Different forms of delivery**

- **Further research into other aspects of the operation task: cognitive and physical.**

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