

Examining the Relative Effectiveness of Child Passenger Safety Information: Recommendations for Increased Comprehension and Compliance

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Introduction

- Age and size-appropriate restraints and rear seating reduce injury in crashes. (Arbogast et al., 2009; NHTSA, 2016; Rice & Anderson, 2009)
- Parents struggle to comply with child passenger safety (CPS) recommendations, and frequently make mistakes. (Greenwell, 2015; NHTSA, 2015; Decina & Lococo, 2007)
- Past studies have looked at education, rental programs, and enforcement interventions to increase correct use with child restraints. (Dellinger, Sleet, Shults, & Rinehart, 2007; Dukehart, Walker, Lococo, Decina, & Staplin, 2007; Ebel, Koepsell, Bennett, & Rivara, 2003; King, Monroe, Applegate, & Cole-Farmer, 2007; Snowdon et al., 2008; Weiss-Laxer, Mello, & Nolan, 2009; Winston, Erkoboni, & Xie, 2007; Zaza, Sleet, Thompson, Sosin, & Bolen, 2001).
- However, very few studies have ever evaluated the *content* or design of the messaging associated with these interventions.

(With notable exceptions; e.g., Morrongiello, Bell, Butac, & Kane, 2013; Will, 2005; Will, Sabo, & Porter, 2009; Winston et al., 2007)

Research Purpose

- Evaluate various methods of framing CPS recommendations, and to examine the relative effectiveness on parents' knowledge, attitudes, and behavioral intentions
- Emphasis framing involves placing focus on specific aspects of the content in order to encourage or discourage certain interpretations of the content.
 - Can affect attitudes and behaviors, even among two otherwise equivalent statements (Chaiken, 1987; Chong & Druckman, 2007; Kahneman, Slovic, & Tversky, 1982).
- Two studies were conducted under contract with NHTSA:
 1. Tested various emphasis frames to determine how to best communicate CPS recommendations
 2. Determine the type and amount of extra information to include with CPS recommendations

Study 1 Methods

- A 5 (Message Group) X 2 (Time) randomized experiment
- 300 parent participants answered a pre-survey, viewed one of four flyer versions or a control version, and completed a post-survey.
 - Philadelphia, PA and Norfolk, VA areas
 - 89% female; Mean age 36; all had kids under 13
 - 34% Black, 61% White, 5% Other races, 5% Hispanic ethnicity
 - 36% reported family incomes below \$50,000
 - 42% held less than a college degree
- The four flyers communicated the same CPS recommendations, but several versions were tested which each employed a different emphasis frame

Study 1 Methods (Cont.)





- Recruitment – Studies took place in Philadelphia, PA suburbs and in Norfolk, VA and its suburbs (Hampton Roads).
- Both sites used various methods to recruit/advertise - flyers via social media to numerous parent clubs, online newspapers, child care facilities, and Safe Kids events.
- Potential participants contacted screeners at both sites. Pre-qualification questions were asked (e.g., children under 13, drive, ability to use computer and understand English on responses to survey). Appointment times to computer labs were set.

Group 1: Natural Progression

(Recommendations organized by the natural progression of seat types)

Right Seat • Right Time • Right Use

Every seat is different. Every child is different. Here is the natural progression of restraint types from birth to teen years...with a bit of advice for best protection at each stage. Follow seat directions and use each type for as long as possible to the top weight and height limits before transitioning to the next seat type. Unrestrained children are 3 times more likely to be injured. Kids are always safest in the BACK SEAT!

| Stage of Childhood | Seat Type | Advice for Stage & Seat Transitions |
|---|--|--|
|  | Rear-facing Car Seats | Children should use rear-facing car seats in the back seat as long as possible to the rear-facing height and weight limits for the seat (even up to age 2 or 3). If your car seat has a rear-facing weight limit of 22 pounds or less, you should change to a convertible car seat with higher rear-facing limits and keep rear-facing for longer. Leg crowding is expected and okay. It does not cause harm as long as the child is within the weight and height limits for the seat. |
|  | Forward-facing Car Seats with Harnesses | Keep your child rear-facing until the top weight or height limits for the rear-facing car seat. Once top rear-facing limits are reached, use a forward-facing car seat with a harness and a tether. Keep your child in a car seat with a harness until he or she reaches the top height or weight limit for the harness. |
|  | Booster Seats | Use car seats with harnesses to the top weight or height limits for the harnesses. Once children outgrow harnesses, use a booster seat in the back seat until the seat belt fits properly . A booster seat is often needed until a child is around 4 feet 9 inches tall. Your child may be about 12 years old before he/she is ready for a seat belt. |
|  | Seat Belts | Older children should use a lap-shoulder seat belt in the back seat once they outgrow a booster seat. They have not outgrown a booster seat until the seat belt fits correctly: (1) The shoulder strap should cross the center of the chest and rest on the shoulder (not the neck). (2) The lap belt should fit low and snug on the upper thighs (not the stomach). (3) The knees should bend at the edge of the vehicle seat when sitting all the way back. |



Group 1 – Natural Progression

- Text and Photos highlighted natural progression.
- Photos represented each phase of childhood, but removed all references to age and all mention of upper limits for common seats as a factor for determining transitions.
- Quelled perception that age 8 is the maximum, and mentioned that it may take up to 12 years old for a child to be big enough to use a seat belt alone.
- Need for back seat positioning was fully integrated and highlighted throughout the recommendations.

Group 2: Premature Transition

(Recommendations which emphasized avoiding premature transition)

Right Seat • Right Time • Right Use

Unrestrained children are 3 times more likely to be injured in a crash.

Follow these 4
Steps to Keep
Kids Safe in
the Car



1. Keep Kids Rear-Facing as Long as Possible:

Children should use rear-facing car seats in the back seat as long as possible to the rear-facing height and weight limits for the seat (even up to age 2 or 3). If your car seat has a rear-facing weight limit of 22 pounds or less, you should change to a convertible car seat with higher rear-facing weight and height limits and keep rear-facing for longer. Leg crowding is expected and okay. It does not cause harm as long as the child is within weight and height limits for the seat.



2. Keep Kids in Seats with Harnesses as Long as Possible:

Once top rear-facing limits are reached, children should use a forward-facing car seat with a harness and tether in the back seat. Use a car seat with a harness as long as possible to the top height or weight limit for the harness.



3. Use Booster Seats until the Belt Fits:

Children should use booster seats in the back seat until the seat belt fits. Kids are not ready for a belt until they pass this test without the booster: (1) They can sit all the way back in the vehicle seat with knees bent at the edge of the seat. (2) The shoulder strap crosses the center of the chest and rests on one shoulder (not the neck). (3) The lap belt fits low & snug on the upper thighs (not the stomach).



4. Keep Kids Belted in the Back until Age 13:

Older children should ride in a lap-shoulder seat belt in the back seat once they outgrow a booster seat, which may not happen until close to 12 years old. The back seat is safest for all children.



Group 2 – Child Restraint Recommendations that Focus on Premature Graduation

- Text and Photos drew attention to premature graduation.
- Determined the value of organizing cps information around the best practice guidance for delaying transitions between stages of child restraints.
- Emphasized message that counters premature graduation to the next stage.
- Encouraged keeping children in harnessed seats for as long as the harness weight and height limits will allow.
- Removed all references to age and upper limits for common seats, and highlighted the need for back seat positioning at all stages.

Group 3: Risk Reduction

(Recommendations which emphasized risk-reduction rationale)

Reducing Car Crash Injury = Right Seat + Right Time + Right Use

- In a crash, the vehicle stops or changes direction in fractions of a second.
- Everyone is thrust in the direction the car was traveling.
- Unrestrained children are 3 times more likely to be injured.
- Your child's restraint is made to stop your child with the vehicle & reduce harm.
- The better the fit to your child's growing body, the better the protection.

BIRTH



HERE'S WHAT TO DO:

- Start your child in a REAR-FACING CAR SEAT IN THE BACK SEAT. Use as long as possible to the top rear-facing weight and height limits on the seat (even up to age 2 or 3).
- If your car seat has a rear-facing limit of 22 pounds or less, change to a convertible seat with higher rear-facing weight limits. Keep rear-facing longer.
- Leg crowding is expected & okay. It does not cause harm as long as child is within weight & height limits for the seat.

HERE'S WHY:

- A rear-facing car seat moves with your child and absorbs crash forces.
- Cradles to reduce harm to neck & spine
- Kids under 2 are more likely to be injured if forward facing.



HERE'S WHAT TO DO:

- Once top rear-facing limits are reached, use a FORWARD-FACING CAR SEAT WITH A HARNESS AND tether in the back seat.
- Remember to keep rear-facing as long as possible before turning forward.
- Use a car seat with a harness as long as possible to the top height or weight limit for the harness.

HERE'S WHY:

- Harnesses spread crash forces over strong parts of the body.
- Keeps body positioned in a crash
- The tether limits head injuries by reducing movement in a crash.



HERE'S WHAT TO DO:

- Once a child outgrows the top limits for the harnessed car seat, use a BOOSTER SEAT IN THE BACK SEAT.
- Use a booster seat until the belt fits correctly (see next step).
- A booster seat is often needed until 4 ft 9 in tall. Your child may be 12 years old before ready for a belt.

HERE'S WHY:

- A booster raises a child up so the belt rests over strong body parts.
- Decreases stomach, neck, & spine injuries
- Keeps kids from putting the shoulder belt under their arm or behind their back, which causes harm in a crash

TO TEEN YEARS



HERE'S WHAT TO DO:

- Kids should ride in a lap and shoulder SEAT BELT IN THE BACK SEAT once they outgrow a booster seat.
- Kids are ready for a seat belt when:
1) The shoulder strap crosses the center of the chest and rests on the shoulder (not the neck).
2) The lap belt fits low on the thighs (not the stomach).
3) Knees can bend when sitting all the way back in the seat.
- Use the back seat for kids under 13.

HERE'S WHY:

- A seat belt keeps the child in the vehicle.
- Spreads crash forces
- Protects head & spine
- Back seat is safer than the front

Kids under age 13 are nearly two times safer in the back seat because they are farthest from the most common kind of crash and from frontal airbags. Front airbags are meant for teens and adults.





Group 3 – Child Restraint Recommendations that Explain Risk-Reduction Rationale

- Communicated risk-reduction potential and rationale (in a lay-friendly succinct manner avoiding statistics) behind each stage recommendation.
- Message focused on why each car seat/configuration makes a difference for safety.
- Provided reasons for recommendations given for each stage. “Here’s What to Do” “Here’s Why”
- Provided photos illustrating stages of restraints
- Removed all references to age and upper limits for common seats; and fully integrated the need for back seat positioning at all stages.
-

Group 4: Age-Based

(Recommendations organized by age)

Car Seat Recommendations for Children



- Select a car seat based on your child's age and size, and choose a seat that fits in your vehicle and use it every time.
- Always refer to your specific car seat manufacturer's instructions; read the vehicle owner's manual on how to install the car seat using the seat belt or LATCH system; and check height and weight limits.
- To maximize safety, keep your child in the car seat for as long as possible, as long as the child fits within the manufacturer's height and weight requirements.
- Keep your child in the back seat at least through age 12.

AGE



Birth – 12 months

Your child under age 1 should always ride in a rear-facing car seat. There are different types of rear-facing car seats: Infant-only seats can only be used rear-facing. Convertible and 3-in-1 car seats typically have higher height and weight limits for the rear-facing position, allowing you to keep your child rear-facing for a longer period of time.



1 – 3 years

Keep your child rear-facing as long as possible. It's the best way to keep him or her safe. Your child should remain in a rear-facing car seat until he or she reaches the top height or weight limit allowed by your car seat's manufacturer. Once your child outgrows the rear-facing car seat, your child is ready to travel in a forward-facing car seat with a harness.



4 – 7 years

Keep your child in a forward-facing car seat with a harness until he or she reaches the top height or weight limit allowed by your car seat's manufacturer. Once your child outgrows the forward-facing car seat with a harness, it's time to travel in a booster seat, but still in the back seat.



8 – 12 years

Keep your child in a booster seat until he or she is big enough to fit in a seat belt properly. For a seat belt to fit properly the lap belt must lie snugly across the upper thighs, not the stomach. The shoulder belt should lie snug across the shoulder and chest and not cross the neck or face. Remember: your child should still ride in the back seat because it's safer there.

DESCRIPTION (RESTRAINT TYPE)



A **REAR-FACING CAR SEAT** is the best seat for your young child to use. It has a harness and in a crash, cradles and moves with your child to reduce the stress to the child's fragile neck and spinal cord.



A **FORWARD-FACING CAR SEAT** has a harness and tether that limits your child's forward movement during a crash.



A **BOOSTER SEAT** positions the seat belt so that it fits properly over the stronger parts of your child's body.



A **SEAT BELT** should lie across the upper thighs and be snug across the shoulder and chest to restrain the child safely in a crash. It should not rest on the stomach area or across the neck.



www.facebook.com/childpassengersafety



<http://twitter.com/childseatsafety>

March 21, 2011

Group 4 – Child Restraint Recommendations Organized by Age

- Provided car seat recommendations that are organized under age-based headers.
- Focused on age of child for specific type of car seat or restraint and fit of child based on car seat manufacturer's instructions for size and height.
- Emphasized importance of harnesses and seat belt positions for rear-facing and forward-facing car seats, as well as booster seats and seat belts.
- Mentioned need to read vehicle owner's manual on how to install the car seat using the seat belt or LATCH system; and the need to check height and weight limits.

Group 5: No Education Control

(No education control condition)

Please answer the following questions:



1. Which car seat do you prefer?
 - a) The car seat on the left
 - b) The car seat in the middle
 - c) The car seat on the right

2. What is the most important reason for your choice?
 - a) Color of the car seat
 - b) Style of the car seat
 - c) That car seat looks more safe
 - d) The features of the car seat



Group 5 (Control)

- *No instructional material was provided.*
- *Photos of various car seats on the market were displayed and participants were asked to rate their preferences based on style, color, and other characteristics*
- *This exercise allowed for elapsed time between their pretest and post-test measures, as in the other study conditions, without providing education.*

Measures (Measurement Subscales)

- Knowledge of Restraints (8 items)
- Child passenger safety knowledge (15 items)
- Perception of efficacy and threat - risk behavior diagnosis scale (16 items)
- Attitudes (8 items) and stated intentions (9 items)
- Judgments of relevance and acceptability (10 items)...(used in post-test only)
- Installation (Study 2 only)
- Demographics and other participant information

Study 1 Results

- Performed analyses of covariance and pairwise comparisons with Sidak's adjustment for Type 1 error
- Significant main effect for flyer version on 11 subscales after adjusting for pretest scores.
 - Restraint selection score
 - 3 Knowledge scales (back seat, booster, rear-facing)
 - 2 Efficacy scales (total, self)
 - 4 Attitudes scales (overall, booster, harnessed seats, rear-facing)
 - Stated intentions

Study 1 Results

- The Risk-Reduction Rationale flyer outperformed other flyers for many subscales, and significantly differed from control for the most subscales (8 of 11)

Reducing Car Crash Injury = Right Seat + Right Time + Right Use

- In a crash, the vehicle stops or changes direction in fractions of a second.
- Everyone is thrust in the direction the car was traveling.
- Unrestrained children are 3 times more likely to be injured.
- Your child's restraint is made to stop your child with the vehicle & reduce harm.
- The better the fit to your child's growing body, the better the protection.



BIRTH







TO TEEN YEARS

HERE'S WHAT TO DO:

- Start your child in a REAR-FACING CAR SEAT IN THE BACK SEAT. Use as long as possible to the top rear-facing weight and height limits on the seat (even up to age 2 or 3).
- If your car seat has a rear-facing limit of 22 pounds or less, change to a convertible seat with higher rear-facing weight limits. Keep rear-facing longer.
- Leg crowding is expected & okay. It does not cause harm as long as child is within weight & height limits for the seat.

HERE'S WHY:

- A rear-facing car seat moves with your child and absorbs crash forces.
- Cradles to reduce harm to neck & spine
- Kids under 2 are more likely to be injured if forward facing.

HERE'S WHAT TO DO:

- Once top rear-facing limits are reached, use a FORWARD-FACING CAR SEAT WITH A HARNESS and tether in the back seat.
- Remember to keep rear-facing as long as possible before turning forward.
- Use a car seat with a harness as long as possible to the top height or weight limit for the harness.

HERE'S WHY:

- Harnesses spread crash forces over strong parts of the body.
- Keeps body positioned in a crash
- The tether limits head injuries by reducing movement in a crash.

HERE'S WHAT TO DO:

- Once a child outgrows the top limits for the harnessed car seat, use a BOOSTER SEAT IN THE BACK SEAT.
- Use a booster seat until the belt fits correctly (see next step).
- A booster seat is often needed until 4 ft 9 in tall. Your child may be 12 years old before ready for a belt.

HERE'S WHY:

- A booster raises a child up so the belt rests over strong body parts.
- Decreases stomach, neck, & spine injuries
- Keeps kids from putting the shoulder belt under their arm or behind their back, which causes harm in a crash

HERE'S WHAT TO DO:

- Kids should ride in a lap and shoulder SEAT BELT IN THE BACK SEAT once they outgrow a booster seat.
- Kids are ready for a seat belt when: 1) The shoulder strap crosses the center of the chest and rests on the shoulder (not the neck). (2) The lap belt fits low on the thighs (not the stomach). (3) Knees can bend when sitting all the way back in the seat.
- Use the back seat for kids under 13.

HERE'S WHY:

- A seat belt keeps the child in the vehicle.
- Spreads crash forces
- Protects head & spine
- Back seat is safer than the front

Kids under age 13 are nearly two times safer in the back seat because they are farthest from the most common kind of crash and from frontal airbags. Front airbags are meant for teens and adults.

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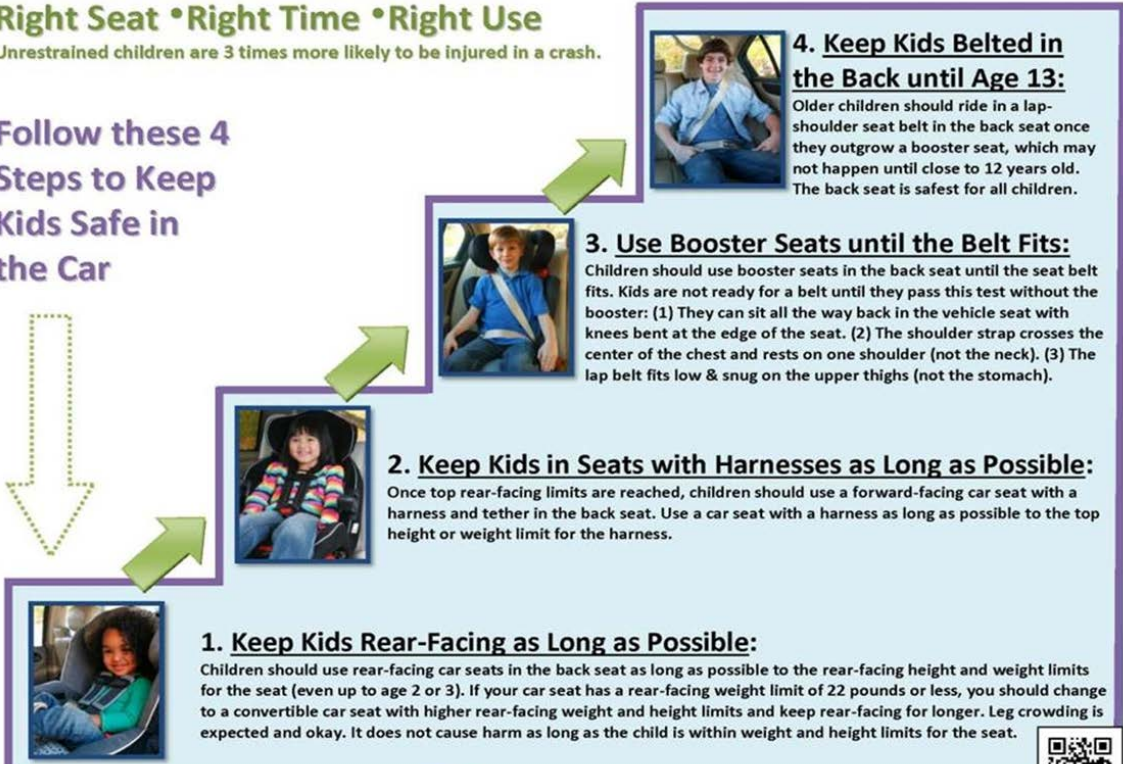


Study 1 Results

- For instilling caregiver self-efficacy related to child passenger safety, the Premature Transition flyer outperformed all other flyers.


Right Seat • Right Time • Right Use
Unrestrained children are 3 times more likely to be injured in a crash.

Follow these 4 Steps to Keep Kids Safe in the Car



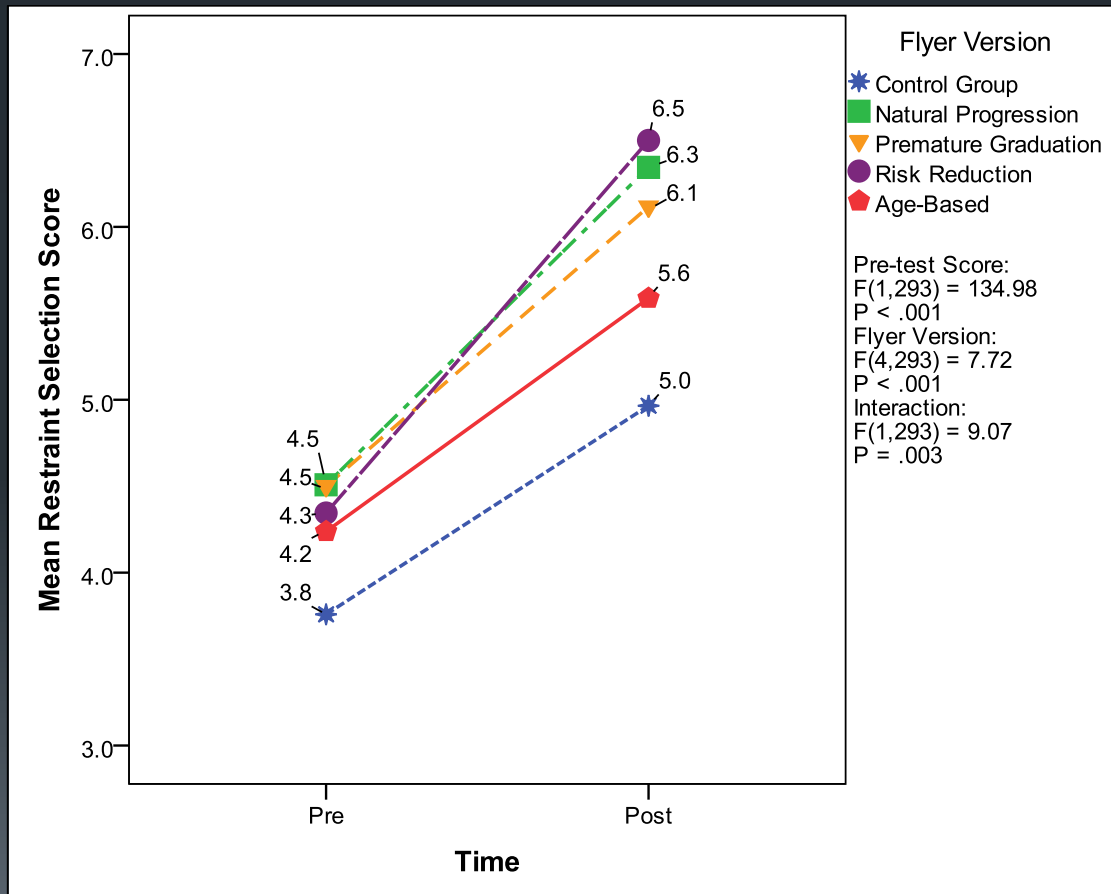
- 1. Keep Kids Rear-Facing as Long as Possible:**
Children should use rear-facing car seats in the back seat as long as possible to the rear-facing height and weight limits for the seat (even up to age 2 or 3). If your car seat has a rear-facing weight limit of 22 pounds or less, you should change to a convertible car seat with higher rear-facing weight and height limits and keep rear-facing for longer. Leg crowding is expected and okay. It does not cause harm as long as the child is within weight and height limits for the seat.
- 2. Keep Kids in Seats with Harnesses as Long as Possible:**
Once top rear-facing limits are reached, children should use a forward-facing car seat with a harness and tether in the back seat. Use a car seat with a harness as long as possible to the top height or weight limit for the harness.
- 3. Use Booster Seats until the Belt Fits:**
Children should use booster seats in the back seat until the seat belt fits. Kids are not ready for a belt until they pass this test without the booster: (1) They can sit all the way back in the vehicle seat with knees bent at the edge of the seat. (2) The shoulder strap crosses the center of the chest and rests on one shoulder (not the neck). (3) The lap belt fits low & snug on the upper thighs (not the stomach).
- 4. Keep Kids Belted in the Back until Age 13:**
Older children should ride in a lap-shoulder seat belt in the back seat once they outgrow a booster seat, which may not happen until close to 12 years old. The back seat is safest for all children.

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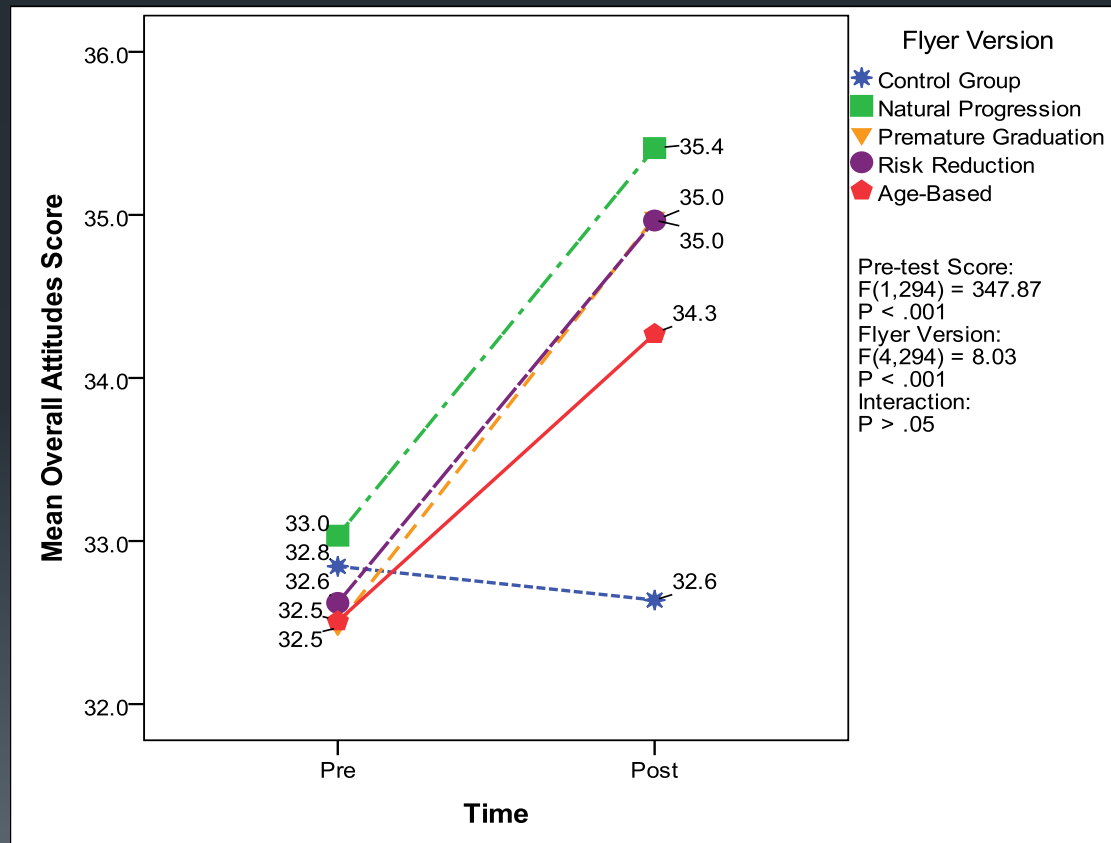
Restraint Selection Task

When faced with the task of selecting appropriate restraints for given children, the Risk-Reduction Rationale flyer led to the greatest improvement in scores from pre- to posttest.



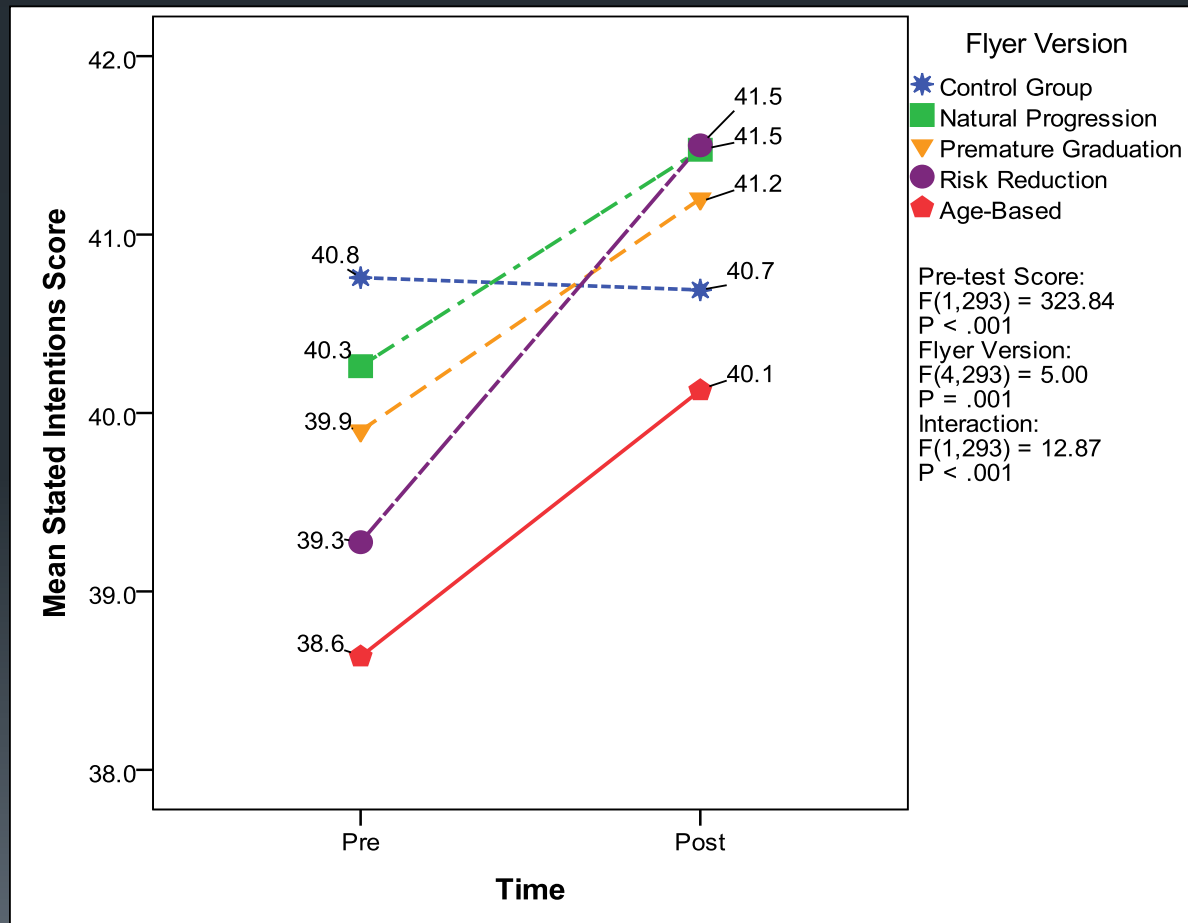
Changes in Attitudes

All four flyer versions performed equally well in regards to overall attitude change; however, the Age-Based flyer did not differ from Control when looking specifically at booster attitudes and rear-facing attitudes.



Changes in Stated Intentions

The Risk-Reduction Rationale flyer resulted in the greatest increase in parents' behavioral intentions to follow proper child restraint recommendations.



Parent Preferences Mirror Experimental Findings

- Following this experimental comparison, we also led 6 discussion groups with 32 additional parents to examine qualitative preferences and garner feedback for improvement of Study 1 messages
- The risk-reduction rationale was preferred by 69% of participants
 - Most informative
 - Here's what to do
 - Here's why
 - Bullet points
 - Column format
 - Arrows/flow intuitive
 - Prefer less words but nevertheless wanted to information

Reducing Car Crash Injury = Right Seat + Right Time + Right Use

- In a crash, the vehicle stops or changes direction in fractions of a second.
- Everyone is thrust in the direction the car was traveling.
- Unrestrained children are 3 times more likely to be injured.
- Your child's restraint is made to stop your child with the vehicle & reduce harm.
- The better the fit to your child's growing body, the better the protection.

The infographic is a horizontal flow diagram with four stages: BIRTH, Toddler, School-age, and TO TEEN YEARS. Each stage features a photo of a child in a car seat and a text box with instructions and rationale. Arrows connect the stages from left to right.

BIRTH

HERE'S WHAT TO DO:

- Start your child in a REAR-FACING CAR SEAT IN THE BACK SEAT. Use as long as possible to the top rear-facing weight and height limits on the seat (even up to age 2 or 3).
- If your car seat has a rear-facing limit of 22 pounds or less, change to a convertible seat with higher rear-facing weight limits. Keep rear-facing longer.
- Leg crowding is expected & okay. It does not cause harm as long as child is within weight & height limits for the seat.

HERE'S WHY:

- A rear-facing car seat moves with your child and absorbs crash forces.
- Cradles to reduce harm to neck & spine
- Kids under-2 are more likely to be injured if forward facing.

TOODLER

HERE'S WHAT TO DO:

- Once top rear-facing limits are reached, use a FORWARD-FACING CAR SEAT WITH A HARNESS and tether in the back seat.
- Remember to keep rear-facing as long as possible before turning forward.
- Use a car seat with a harness as long as possible to the top height or weight limit for the harness.

HERE'S WHY:

- Harnesses spread crash forces over strong parts of the body.
- Keeps body positioned in a crash
- The tether limits head injuries by reducing movement in a crash.

SCHOOL-AGE

HERE'S WHAT TO DO:

- Once a child outgrows the top limits for the harnessed car seat, use a BOOSTER SEAT IN THE BACK SEAT.
- Use a booster seat until the belt fits correctly (see next step).
- A booster seat is often needed until 4 ft 9 in tall. Your child may be 12 years old before ready for a belt.

HERE'S WHY:

- A booster raises a child up so the belt rests over strong body parts.
- Decreases stomach, neck, & spine injuries
- Keeps kids from putting the shoulder belt under their arm or behind their back, which causes harm in a crash

TO TEEN YEARS

HERE'S WHAT TO DO:

- Kids should ride in a lap and shoulder SEAT BELT IN THE BACK SEAT once they outgrow a booster seat.
- Kids are ready for a seat belt when: 1) The shoulder strap crosses the center of the chest and rests on the shoulder (not the neck), 2) The lap belt fits low on the thighs (not the stomach), 3) Knees can bend when sitting all the way back in the seat.
- Use the back seat for kids under 13.

HERE'S WHY:

- A seat belt keeps the child in the vehicle.
- Spreads crash forces
- Protects head & spine
- Back seat is safer than the front

Kids under age 13 are nearly two times safer in the back seat because they are farthest from the most common kind of crash and from frontal airbags. Front airbags are meant for teens and adults.

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Study 2 Methods

- A 4 (Information Group) X 2 (Time) randomized experiment.
- 240 parent participants answered a pre-survey, viewed one of four flyer versions, and completed a post-survey.
 - Philadelphia, PA and Norfolk, VA areas
 - 91% female; Mean age 34; all had kids under 8
 - 23% Black, 72% White, 5% Other races, 3% Hispanic ethnicity
 - 43% reported family incomes below \$50,000
 - 53% held less than a college degree
- The four flyers communicated the same CPS recommendations, but several versions were tested either alone or in combination with other types of CPS information.
- Same recruitment methodology as Study 1, except no repeat participants.

Group 1: Recommendations presented alone

Reducing Car Crash Injury: Right Seat • Right Time • Right Use



1. **Rear-Facing Car Seats:** Children should use rear-facing car seats in the back seat as long as possible to the rear-facing height and weight limits for the seat (even up to age 2 or 3). As your child grows, you may need to change to a convertible seat with higher rear-facing height and weight limits in order to keep your child rear-facing for longer. Leg crowding is expected and okay. It does not cause harm as long as the child is within the weight and height limits for the car seat.



2. **Forward-Facing Car Seats with Harnesses:** Keep your child rear-facing until the top weight or height limits for the rear-facing seat. Once top rear-facing limits are reached, use a forward-facing car seat with a harness and a tether, in the back seat. Keep your child in a car seat with a harness until he or she reaches the top height or weight limit for the harness.



3. **Booster Seats:** Use car seats with harnesses to the top weight or height limits for the harnesses. Once children outgrow harnesses, use a booster seat in the back seat *until the seat belt fits properly* (see Step 4). A booster seat is often needed until a child is around 4 feet 9 inches tall. Your child may be about 12 years old before he/she is ready for a seat belt.



4. **Seat Belts:** Older children should use a lap-shoulder seat belt in the back seat once they outgrow a booster seat. They have not outgrown a booster seat until the seat belt fits correctly: (1) The shoulder strap should cross the center of the chest and rest on the shoulder (not the neck). (2) The lap belt should fit low and snug on the upper thighs (not the stomach). (3) The knees should bend at the edge of the vehicle seat when sitting all the way back.

Seats and cars vary! Check the car seat instructions and vehicle owner's manual for help specific to your needs.
Unrestrained children are 3 times more likely to be injured than restrained children. Kids are always safest in the back seat!



Group 2: Recommendations + installation tips

Reducing Car Crash Injury: Right Seat • Right Time • Right Use



- 1. Rear-Facing Car Seats:** Children should use rear-facing car seats in the back seat as long as possible to the rear-facing height and weight limits for the seat (even up to age 2 or 3). As your child grows, you may need to change to a convertible seat with higher rear-facing height and weight limits in order to keep your child rear-facing for longer. Leg crowding is expected and okay. It does not cause harm as long as the child is within the weight and height limits for the car seat.
 - Use the back seat; NEVER put a rear-facing seat in front of an active frontal airbag.
 - Install the seat rear-facing at a 45 degree angle.
 - Install the seat tightly in the vehicle—there should be less than an inch of movement.
 - If using the vehicle seat belt to install, you must lock it to keep it tight—refer to instructions for locking.
 - You may use the lower car seat anchors to install *instead* of the seat belt (never both); follow car seat anchor weight limits.
 - Tighten the harness snugly with the chest clip at armpit level and shoulder straps at or below the shoulders.



- 2. Forward-Facing Car Seats with Harnesses:** Keep your child rear-facing until the top weight or height limits for the rear-facing seat. Once top rear-facing limits are reached, use a forward-facing car seat with a harness and a tether, in the back seat. Keep your child in a car seat with a harness until he or she reaches the top height or weight limit for the harness.
 - Install the seat tightly in the vehicle—there should be less than an inch of movement.
 - If using the vehicle seat belt to install, you must lock it to keep it tight—refer to instructions for locking.
 - You may use the lower car seat anchors to install *instead* of the seat belt (never both); follow car seat anchor weight limits.
 - Always use the top tether (positioned tightly) when forward facing.
 - Tighten the harness snugly with the chest clip at armpit level and shoulder straps at or above the shoulders.



- 3. Booster Seats:** Use car seats with harnesses to the top weight or height limits for the harnesses. Once children outgrow harnesses, use a booster seat in the back seat *until the seat belt fits properly* (see Step 4). A booster seat is often needed until a child is around 4 feet 9 inches tall. Your child may be about 12 years old before he/she is ready for a seat belt.
 - The seat belt should fit low across the hips, cross the center of the chest, and rest on one shoulder away from the neck and face.
 - The shoulder belt is just as essential as the lap belt. Never place it behind the back or under the arm.
 - Be sure to use a high-back booster if the vehicle seat does not have head restraints.



- 4. Seat Belts:** Older children should use a lap-shoulder seat belt in the back seat once they outgrow a booster seat. They have not outgrown a booster seat until the seat belt fits correctly: (1) The shoulder strap should cross the center of the chest and rest on the shoulder (not the neck). (2) The lap belt should fit low and snug on the upper thighs (not the stomach). (3) The knees should bend at the edge of the vehicle seat when sitting all the way back.
 - The shoulder belt is just as essential as the lap belt. Never place it behind the back or under the arm.
 - The back seat is safest until age 13.

Seats and cars vary! Check the car seat instructions and vehicle owner's manual for help specific to your needs.
Unrestrained children are 3 times more likely to be injured than restrained children. Kids are always safest in the back seat!



Group 3: Recommendations with Statistics

Reducing Car Crash Injury: Right Seat • Right Time • Right Use



1. **Rear-Facing Car Seats:** Children should use rear-facing car seats in the back seat as long as possible to the rear-facing height and weight limits for the seat (even up to age 2 or 3). As your child grows, you may need to change to a convertible seat with higher rear-facing height and weight limits in order to keep your child rear-facing for longer. Leg crowding is expected and okay. It does not cause harm as long as the child is within the weight and height limits for the car seat.



2. **Forward-Facing Car Seats with Harnesses:** Keep your child rear-facing until the top weight or height limits for the rear-facing seat. Once top rear-facing limits are reached, use a forward-facing car seat with a harness and a tether, in the back seat. Keep your child in a car seat with a harness until he or she reaches the top height or weight limit for the harness.



3. **Booster Seats:** Use car seats with harnesses to the top weight or height limits for the harnesses. Once children outgrow harnesses, use a booster seat in the back seat *until the seat belt fits properly* (see Step 4). A booster seat is often needed until a child is around 4 feet 9 inches tall. Your child may be about 12 years old before he/she is ready for a seat belt.



4. **Seat Belts:** Older children should use a lap-shoulder seat belt in the back seat once they outgrow a booster seat. They have not outgrown a booster seat until the seat belt fits correctly: (1) The shoulder strap should cross the center of the chest and rest on the shoulder (not the neck). (2) The lap belt should fit low and snug on the upper thighs (not the stomach). (3) The knees should bend at the edge of the vehicle seat when sitting all the way back.

Kids at Risk— Some Startling Facts:

- 3 out of 4 car seats are used incorrectly
- Nearly half of the kids who die in car crashes are unrestrained
- 9 out of 10 kids' car seats are turned forward-facing before they are ready
- 1 out of 4 kids are moved out of harnessed car seats too early
- 1 out of 2 kids' forward-facing car seats are not attached with a tether
- 3 out of 5 booster-age children are moved to seat belts too soon
- 3 out of 4 kids between ages 8 and 13 ride in the front seat frequently

Seats and cars vary! Check the car seat instructions and vehicle owner's manual for help specific to your needs.

Unrestrained children are 3 times more likely to be injured than restrained children. Kids are always safest in the back seat!



Group 4: Recommendations + Installation tips + Statistics

Reducing Car Crash Injury: Right Seat • Right Time • Right Use



1. Rear-Facing Car Seats: Children should use rear-facing car seats in the back seat as long as possible to the rear-facing height and weight limits for the seat (even up to age 2 or 3). As your child grows, you may need to change to a convertible seat with higher rear-facing height and weight limits in order to keep your child rear-facing for longer. Leg crowding is expected and okay. It does not cause harm as long as the child is within the weight and height limits for the car seat.

- Use the back seat; NEVER put a rear-facing seat in front of an active frontal airbag.
- Install the seat rear-facing at a 45 degree angle.
- Install the seat tightly in the vehicle—there should be less than an inch of movement.
- If using the vehicle seat belt to install, you must lock it to keep it tight—refer to instructions for locking.
- You may use the lower car seat anchors to install *instead* of the seat belt (never both); follow car seat anchor weight limits.
- Tighten the harness snugly with the chest clip at armpit level and shoulder straps at or below the shoulders.



2. Forward-Facing Car Seats with Harnesses: Keep your child rear-facing until the top weight or height limits for the rear-facing seat. Once top rear-facing limits are reached, use a forward-facing car seat with a harness and a tether, in the back seat. Keep your child in a car seat with a harness until he or she reaches the top height or weight limit for the harness.

- Install the seat tightly in the vehicle—there should be less than an inch of movement.
- If using the vehicle seat belt to install, you must lock it to keep it tight—refer to instructions for locking.
- You may use the lower car seat anchors to install *instead* of the seat belt (never both); follow car seat anchor weight limits.
- Always use the top tether (positioned tightly) when forward facing.
- Tighten the harness snugly with the chest clip at armpit level and shoulder straps at or above the shoulders.



3. Booster Seats: Use car seats with harnesses to the top weight or height limits for the harnesses. Once children outgrow harnesses, use a booster seat in the back seat *until the seat belt fits properly* (see Step 4). A booster seat is often needed until a child is around 4 feet 9 inches tall. Your child may be about 12 years old before he/she is ready for a seat belt.

- The seat belt should fit low across the hips, cross the center of the chest, and rest on one shoulder away from the neck and face.
- The shoulder belt is just as essential as the lap belt. Never place it behind the back or under the arm.
- Be sure to use a high-back booster if the vehicle seat does not have head restraints.



4. Seat Belts: Older children should use a lap-shoulder seat belt in the back seat once they outgrow a booster seat. They have not outgrown a booster seat until the seat belt fits correctly: (1) The shoulder strap should cross the center of the chest and rest on the shoulder (not the neck). (2) The lap belt should fit low and snug on the upper thighs (not the stomach). (3) The knees should bend at the edge of the vehicle seat when sitting all the way back.

- The shoulder belt is just as essential as the lap belt. Never place it behind the back or under the arm.
- The back seat is safest until age 13.

Kids at Risk—Some Startling Facts:

- 3 out of 4 car seats are used incorrectly
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Seats and cars vary! Check the car seat instructions and vehicle owner's manual for help specific to your needs.

Unrestrained children are 3 times more likely to be injured than restrained children. Kids are always safest in the back seat!

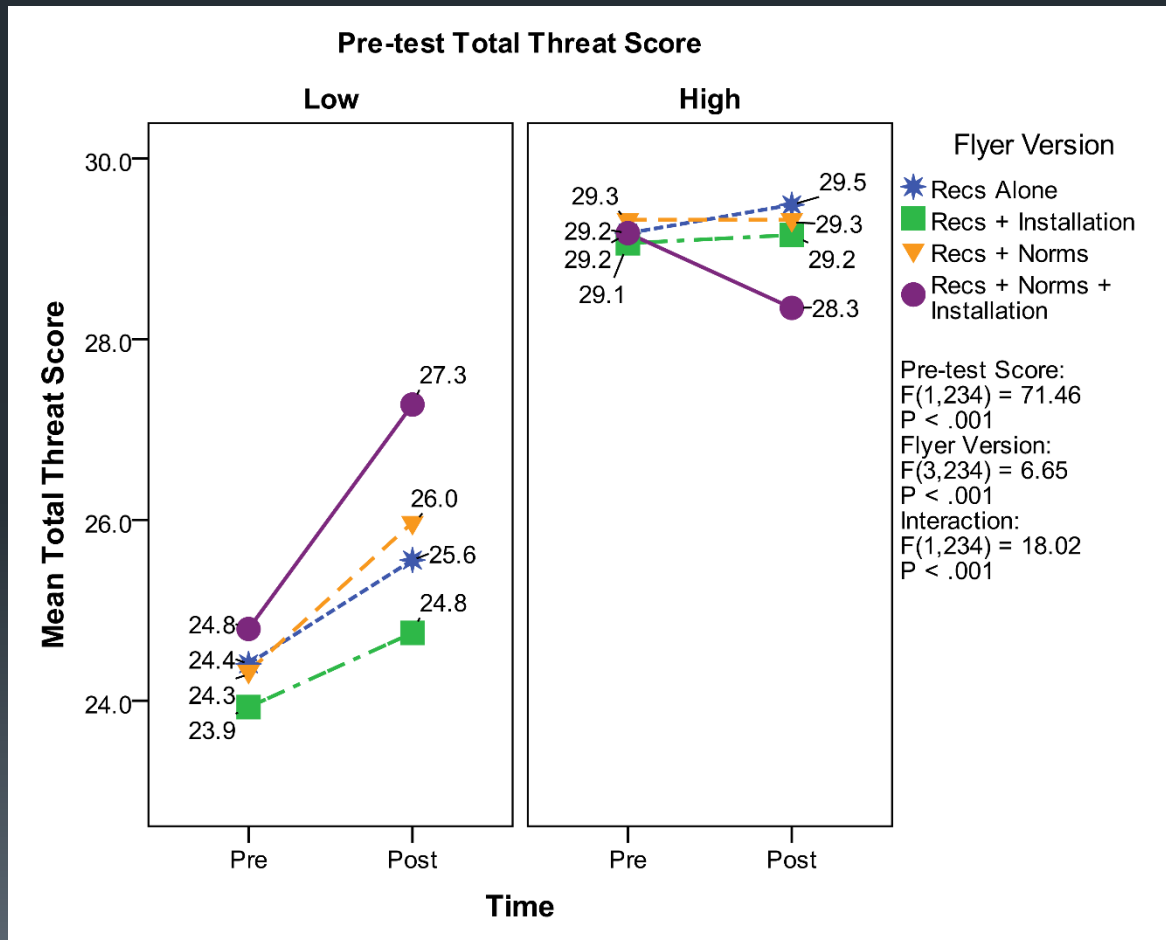


Study 2 Results

- Performed analyses of covariance and pairwise comparisons with Sidak's adjustment for Type 1 error.
 - Significant interactions with pretest scores were present for each main effect, indicating that the effectiveness of each flyer was heavily dependent upon the pretest score of the participant.
- The amount of “extra” information that is helpful on a flyer differs greatly for parents with low versus high preexisting child passenger safety awareness, confidence, and risk perceptions.

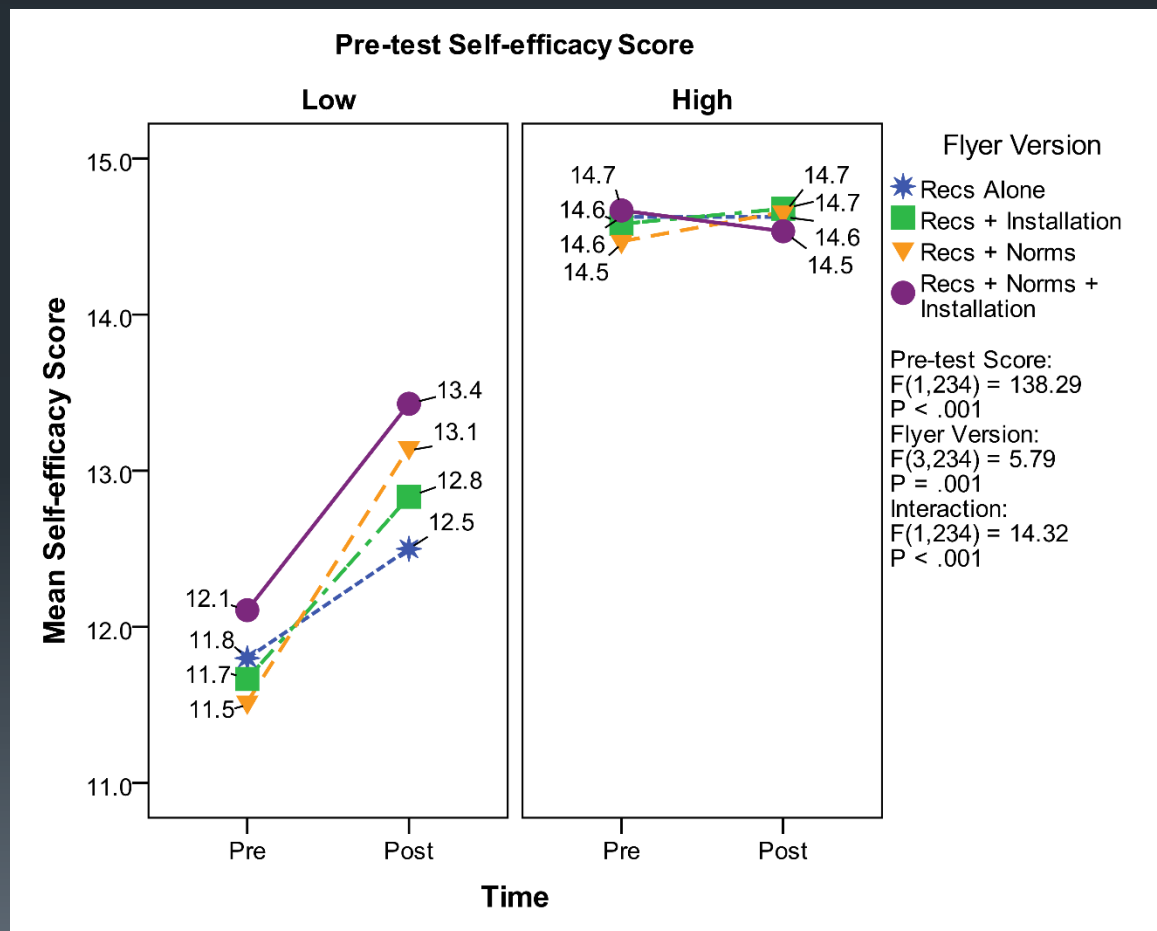
Threat Perceptions

- Detailed extra information led to the greatest gains for those with low incoming threat perceptions; however, this same version was least helpful for those with high incoming perceptions of risk



Self-efficacy

- Flyers with normative information were most helpful in bolstering efficacy for participants with low incoming self-efficacy, while these same versions were least helpful among those with high incoming self-efficacy.



Overall Conclusions

- Study 1:
 - The most advantageous way of framing CPS recommendations is to explain the injury risks behind the information given.
 - Using behavior-based directives in headers boosts caregiver confidence in their ability to carry out recommendations.
- Study 2:
 - Parents with higher preexisting CPS awareness and perceptions attend to and benefit more from simplified reminders of recommendations (e.g., information updates),
 - Whereas those with lower preexisting awareness and perceptions benefit more broadly from detailed recommendations that include extra information such as installation tips.

Recommendations for the Field

- Communicate the risk-reduction rationale behind the recommendations
- Use clear behavior-based directives in headers
- Avoid age-based headers
- Fully integrate the need for back seat positioning at all stages
- Create and promote novice-user and experienced-user versions of materials
- Combine expertise of communications professionals and behavioral scientists
- Support additional research

Thank you! Questions?

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Reports and Publications for More Information:

1. Decina, L.E. , Will, K.E., Maple, E.L., Perkins, A.M., Kirley, B., and Mastromatto, Tia (2015). *Effectiveness of child passenger safety information for the safe transportation of children*. Final Report No. DOT HS 812 245. Washington, DC: National Highway Traffic Safety Administration.
2. Will, K. E., Decina, L. E., Maple, E. L., & Perkins, A. M. (2015). Examining the Relative Effectiveness of Different Message Framing Strategies for Child Passenger Safety: Recommendations for Increased Comprehension and Compliance, *Accident Analysis and Prevention*, 79, 170-181. DOI: 10.1016/j.aap.2015.03.008
3. Will, K. E., Decina, L.E., Maple, E.L., and Perkins, A.M. (2015), Effectiveness of child passenger safety information for the safe transportation of children. *Traffic Safety Facts Research Note*. (Report No. DOT HS 812 121). Washington, DC: National Highway Traffic Safety Administration.