CHILD BOOSTER SEAT SAFETY: AN ATTITUDINAL MODEL OF THE USE OF BOOSTER SEATS

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ABSTRACT

When used appropriately, booster seats can greatly increase protection of children's lives. Toward that end, children under 4'9", usually from age 4 to 8, when riding in a vehicle are required by law to sit in a booster seat restrained by a seat belt. However, research indicates that child safety needs to be better enforced. A program on child booster seat safety has been initiated in Tennessee. Specifically, Ollie's Seatbelt and Booster Seat Safety Program impacted over 57,184 children from 2,928 K-4 classrooms in 154 schools representing 95 counties of Tennessee. In its first year, from August 1, 2007 through September 30, 2008, Ollie Otter reached over 13 percent of Tennessee's 1,156 elementary schools. A research stream also parallels this seatbelt and booster seat safety program. The objective of this paper is to investigate parents' attitudes toward buying booster seats and factors influencing these attitudes. A structural model to investigate the theory behind parents' use of booster seats was developed and tested, and eight hypotheses out of nine have been supported. The attitude toward children while driving was found to influence parents' intentions of using booster seats . Risk attraction and risk aversion characteristics of parents, on the other hand, had major impact on the attitude development towards children while driving.

INTRODUCTION

According to the Center for Disease Control, "In the United States, 1,791 children younger than 15 years were killed and 282,000 were injured as passengers in motor vehicle crashes in 1997 (2007). As stated by the Washington State Booster Seat Coalition (2003), motor-vehicle collisions were the single largest killer of children age 4-8 years because riding unrestrained generated the greatest risk for death and injury among child passengers. The National Highway Traffic Safety Administration's (NHTSA) review of field data revealed that of children ages 0 to 14 killed in motor vehicle crashes during 2005, nearly half were unrestrained" (2006).

Unfortunately, many children who should be in a booster seat restrained by a seat belt are restrained. According to NHTSA, up to 90% of children in the U.S. who should be using booster seats were not using them regularly or at all (2006 and 2007). National SAFE KIDS Coalition (2003) found that only 19% of children who should be restrained in booster seats use them. Glassbrenner and Ye (2007) found that about 41 percent of 4- to 7-year old children were restrained in booster seats in 2006 in the U.S. Another study found that 72% of nearly 3,500 observed child-restraint systems were misused, increasing a child's risk of injury in a crash (NHTSA 2006).

What is a booster seat? Who should use it? What would happen with lack of or improper use of it? What would happen to child passengers only using seatbelts designed for adults with no booster seat in a motor-vehicle crash? All parents should know the answers to these questions by the time they have their first child. The National Safety Belt Coalition (2007) dictated booster seats should be used as a transition to safety belts by older children who had clearly outgrown their booster seat but were not ready for the vehicle-belt system because a booster seat raised a child to ensure the safety belt fit correctly. The shoulder belt should cross the chest and rest snugly on the shoulder, and the lap belt should rest low across the pelvis or hip area. An ill-fitting seat belt during a crash might cause devastating injuries (CNW Group 2008). Seatbelts designed for adults can create the risk of abdominal and spinal-chord injuries to children, and loosely fitting belts can cause facial and/or brain injuries when the head strikes the knees or other surfaces (Wall Street Journal 2003). Every state has its own laws on using seat belts and booster seats (Advocates for Highway and Auto Safety 2007). Tennessee was the first state to enact a law mandating that children be restrained in a safety seat and is also one of only 18 states requiring children up to age 8 to be restrained in a booster seat (Tennessee Department of Safety 2008). The first booster seat law was introduced in Washington State after a fatal accident involving a 4-year-old child using an adult seat belt (Higgins 2005).

Booster seats can greatly improve children's protection when used appropriately; in fact, "A properly used safety seat or booster reduces the chances of a child being seriously injured or killed in a car crash by more than half" (Baltimore Sun 2008). Usually parents protect their children in baby seats until age 4; however, many parents seem unaware of their children's vulnerability when using adult seatbelts before age 9. Booster seats provide 60 percent more protection than seat belts alone for children four to nine years old (CNW Group 2008).

Children's injuries and deaths caused by not using or by misusing seat belts and booster seats must be reduced. This lack of use or misuse may result from parents, family members, and other adults not encouraging child occupants to practice good safety standards and behavior. To remedy this situation, the Ollie Otter Seatbelt and Booster Seat Education Campaign was designed as a comprehensive program to encourage children to use booster seats and seat belts.

From August 1, 2007 through September 30, 2008, Ollie's Seatbelt and Booster Seat Safety Program reached over 57,184 children from 2,928 classrooms in 154 schools representing 95 counties of Tennessee. In its first year, this program impacted over 13 percent of Tennessee's 1,156

elementary schools. In contrast, the first-year project goals were to reach 50 schools and 100 classrooms. Parallel to this program is a research stream that is asking four main questions: (1) What motivates parents to buy and use booster seats for their children? (2) How do parents' various attitudes toward driving and children relate to their intentions toward buying and using booster seats? (3) What impact do situational factors such as state laws, peer pressure and cost of booster seats have on the purchase and use of booster seats? (4) What are the demographic characteristics of parents who prefer to use booster seats versus those who do not?

The current paper includes only the second research question: What are parental attitudes toward buying booster seats, and what other factors influence these attitudes?

CONCEPTUAL FRAMEWORK

Surprisingly, no formal research has been reported about attitudes toward booster seat use. On the other hand, literature on attitude formation and change is rich. To benefit from the literature, researchers have observed situations in which parents preferred to use or not use booster seats. Researchers also conducted informal discussions with parents about booster seat use. This exploratory research on drivers' activities in a typical driving situation revealed that multi-tasking was common. Some drivers like to take risks to enhance the fun of driving, while others are more concerned about their safety. These attitudes are reflected in the vehicle-safety features they choose, as well as in their daily activities. Also, the general attitude of parents toward their children may influence their attitudes toward booster seat purchase and use. Finally, observations revealed a difference in parents' attitudes toward their children in general and their attitudes while driving.
Engaging in multiple activities while driving is common. For example, many drivers are frequently seen talking on their cell phone and eating and drinking whether these activities correlate with an increased number of accidents has created much public debate. During informal interviews, researchers realized some parents believe talking on a cell phone does not influence driving abilities and, therefore, should be tolerated. Others believe that those engaging in other activities while driving should be ticketed as they endanger other drivers and passengers. Those who multi-task while driving are likely to be more attracted to risk taking. In contrast, those who are in favor of banning these activities seem to be more risk averse. Because no research is available about relationships among multi-tasking, risk aversion, and risk attraction, researchers hypothesize the following:

H_{1a}: *Attitude toward multi-tasking while driving and attitude toward risk aversion are likely to positively correlate.*

H_{1b}: *Attitude toward multi-tasking while driving and attitude toward risk attraction are likely to negatively correlate.*

Risk-aversion construct measures personality characteristics towards risk affinity, whereas, risk-attraction construct measures context-dependent risk taking (Conchar, Zinkhan, Peters and Olavarrieta, 2004). Although scales have established reliabilities and validities, these two constructs have not been investigated simultaneously. Therefore, researchers assume that they are different, yet related constructs. Specifically, although some parents like to take some risks, they are likely to behave responsibly towards their children and be more risk averse in situations regarding children. Hence, researchers offer the following hypothesis:

H_2: Attitude toward risk aversion and attitude toward risk attraction are likely to positively correlate.

Donthu and Gilliland (1996) studied risk aversion scale as a personality trait, measuring the degree to which a person expresses a desire to avoid taking risks. This trait can also influence drivers' attitudes toward risk aversion. Risk-averse respondents are likely to show a tendency toward extreme caution (Griffin, Babin and Attaway 1996). Those who are keen on avoiding risky movements in traffic are likely to buckle up. Their motto of"Better safe than sorry" may also influence their attitude toward children while driving and toward their children's behavior. For example, they are less likely to let small children sit in the front seat. They may also enforce seat-belt use for even short errands. Therefore, researchers hypothesize the following:

H_3: Attitude toward risk aversion while driving is likely to have a direct, positive effect on attitude toward children.

H_4: Attitude toward risk aversion while driving is likely to have a direct, positive effect on attitude toward children while driving.

Griffin, Babin and Attaway (1996) and Zuckerman (1971) suggested that risk seekers believed they could easily handle unexpected challenges and hazardous situations. They seek the thrill of risky situations and are likely to carry this trait into their driving. They may prefer fast driving to over-take slow drivers, make more moves in traffic, and fantasize about having race cars. They are also likely to care about their children's well being in general. Yet, as they actively seek the fun of taking risks, they are likely to be aware of the hazards of risky situations. Having children will not likely discourage them from taking risks, but will encourage taking extra precautions while driving to ensure the safety of their children. Therefore, they are likely not to forget to buckle up their children, or to let them out of their booster seats during a trip. While no research exists about how risk seekers are likely to behave in their children's presence, researchers assume that parents will be cautious to protect their children and be more aware of the hazards of risky situations.

Research, however, is necessary to provide evidence supporting or falsifying this assumption, thus the following hypotheses:

H_5: *Attitude toward risk attraction while driving is likely to have a direct, positive effect on attitude toward children.*

H_6: *Attitude toward risk attraction while driving is likely to have a direct, positive effect on attitude toward children while driving.*

The driver's attitude toward children is another influential construct. Those who strongly appreciate their children and feel good about them are less likely to let their children do potentially dangerous activities while driving. Indeed, they may neither let them unbuckle their seatbelts while the car is moving nor forget to secure them in booster seats for short errands. Therefore, researchers make the following hypothesis:

H_7: *Attitude toward children is likely to have a direct, positive effect on attitude toward children while driving.*

Although installing and uninstalling booster seats and changing their location from one vehicle to another are cumbersome and sometimes inconvenient, parents are likely to appreciate booster seats and have a positive attitude toward them because they want to ensure their children's safety during driving. They may not remove them from their seats, no matter how much their children whine about being restrained, hence the following hypothesis:

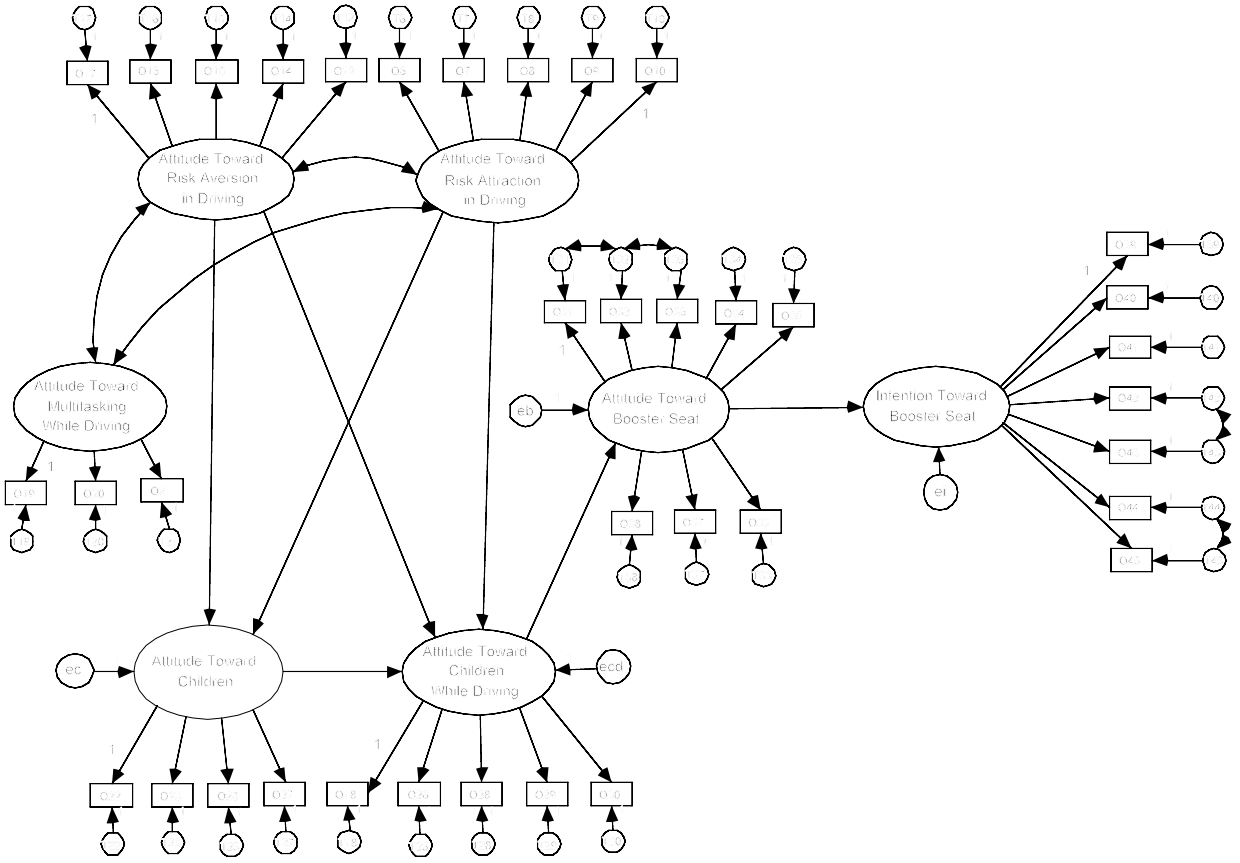
H_8: *Attitude toward children while driving is likely to have a direct, positive effect on attitude toward booster seats.*

A positive attitude about booster seats is likely to make parents not only spend time finding a good booster seat, but also talk to other parents about the benefits of using one. Thus, researchers make the following hypothesis:

H_9: *Attitude toward booster seats is likely have a direct, positive effect on intention towards using booster seats.*

The theoretical model is shown in Figure 1.

Figure 1: an Attitudinal Model of the Use of Booster Seat



METHOD

This research was conducted simultaneously in parallel to the Ollie Otter Program. In this educational campaign, volunteers visit K-4 schools in Tennessee and explain the importance of using seat belts and booster seats to students. The campaign mascot, Ollie the Otter, makes appearances and enforces the campaign message with songs and activities. Students are also encouraged to share their thoughts and feelings with their parents and to send letters to Ollie.

The survey method was used to collect data from parents of students who have been exposed to the booster seat safety program. To expedite the data collection process and ensure an acceptable response rate, teachers distributed the survey to their students, who were take them home to their parents. To ensure anonymity and avoid overstating positive feelings, surveys were distributed in blank envelopes; and no address or identity-related information was collected. Once the surveys

were completed by parents, sealed in the blank envelopes provided, and returned to teachers, the teachers mailed the class package to the researchers. No incentives were provided for the survey respondents. However, as a token of appreciation, teachers were provided two payment vouchers: one to be used for a classroom pizza party allowing for further discussion of Ollie's message: "Wear Seatbelts Everyday: under 4 feet 9 – booster time" and another for personal or classroom needs. Each package was opened and surveys were coded at the research center.

Thirty-one teachers responded with a total of 422 questionnaires. Eight questionnaires were discarded due to missing values, and 414 questionnaires were used for further analysis. Some missing responses were replaced with the item averages before using AMOS 7.0 software to test the theory presented in structural equation modeling. Data collection has continued in parallel to the Ollie Otter program. The 422 responses represent a small coverage of the program reach; however, they provide an opportunity for preliminary analysis.

The survey instrument contains both newly developed and existing scales. For all concepts, respondents rated their agreement or disagreement level using seven-point scales ranging from strongly disagree (1) to strongly agree (7). All seven measurement items describing the subjects' intention toward booster seat use were newly developed for this study. Five items of the subjects' attitude toward booster seat use were adopted from Dabholkar (1994). New items were added to this scale to measure attitude toward such issues as multi-tasking, attitude toward children, attitude toward children while driving constructs based on observations and individual in-depth discussions with parents about how they drive in presence/absence of children, what aggravates them most, what they did to stop distraction, and what they thought about multi-tasking. Items for measuring attitude toward risk aversion in driving was adapted from Donthu and Gilliland's (1996) risk aversion construct, which measures inherent and invariant personality characteristics (Conchar et al., 2004). Five items representing attitude toward risk attraction were adapted from Griffin, Babin and Attaway's (1996) risk attraction construct that can be described as context-dependent willingness to take risks (Conchar et al., 2004).

Demographic analysis showed that the majority of respondents were between 25 and 44 years old (with 48.2% being 25-34 years old and with 33.1% being 35-44 years old). In terms of ethnic origin, 87.4% was Caucasian. Furthermore, 34.9% had a high school diploma, and 24.9% had some college experience. The median income was $59,000 and 75% was married. Respondents had an average of 2.3 vehicles per household.

RESULTS

The first step of analysis was to investigate the constructs' reliability and validity. Coefficient alpha was used to test construct reliability. As shown in Table 1, the reliability and factor loadings of each construct were adequate. The evaluation of discriminant and convergent validities and hypothesis testing were performed using AMOS 7 software package.

Table 1 – Reliability and Construct Validity				
Construct	Item		Loading	Alpha
Intention Toward Booster Seat	Q39	Look for information about booster seats.	0.82	0.90
	Q40	Spend your time to find a good booster seat.	0.94	
	Q41	Compare the benefits of different booster seat brands.	0.93	
	Q42	Buy a booster seat for each child in your household.	0.56	
	Q43	Secure your child into a booster seat every time you drive.	0.53	
	Q44	Discuss the importance of using booster seat with a friend.	0.66	
	Q45	Recommend that your friends use a booster seat for their children.	0.63	
Attitude Toward Booster Seat	Q31	Bad - Good	0.82	0.95
	Q32	Unpleasant - Pleasant	0.83	
	Q33	Harmful - Beneficial	0.92	
	Q34	Unfavorable - Favorable	0.94	
	Q35	Unappealing - Appealing	0.87	
	Q36	Inappropriate - Appropriate	0.98	
	Q37	Foolish - Wise	0.92	
	Q38	Unsafe - Safe	0.84	
Attitude Toward Children	Q22	Children are enjoyment in life.	0.91	0.79
	Q23	I care about the well being of my children.	0.71	
	Q25	I feel good about my children	0.68	
	Q27	I try to protect my children from potential dangers.	0.49	
Attitude Toward Children While Driving (R)	Q18	Wearing a seat belt for a short errand is not always necessary.	0.52	0.70
	Q26	Regardless of their age, my children can responsibly sit in any seat they choose in the car.	0.49	
	Q28	I can do anything to stop my children whining in the car even let them get out of the booster seat.	0.61	
	Q29	Sometimes I forget to tell my children to buckle up.	0.55	
	Q30	When I am driving slowly on a rural road, putting my child in his/her booster seat is unnecessary.	0.51	
Attitude Toward Multi-Tasking While Driving	Q19	Police should ticket those who drive while talking on cell phone.	0.69	0.80
	Q20	Eating while driving is dangerous.	0.80	
	Q21	Drinking beverages while driving is dangerous.	0.77	
Attitude Toward Risk Attraction in Driving (R)	Q6	Fast driving would make driving more pleasant.	0.35	0.71
	Q7	I would like to drive a race car.	0.54	
	Q8	I sometimes do things I know are dangerous just for fun.	0.86	
	Q9	Taking risks can be fun.	0.72	
	Q10	I never hesitate to overtake those who drive very slowly.	0.38	
Attitude Toward Risk Aversion in Driving	Q12	I give the right of way to an aggressive driver if he or she endangers my safety.	0.48	0.71
	Q14	I always buckle up.	0.67	
	Q15	I would rather be safe than sorry.	0.70	
	Q16	I always avoid risky moves in traffic.	0.53	
	Q17	I pay attention to safety features while buying a car.	0.46	
R = Item has been reverse coded				

To test the discriminant validity paths among the constructs, all constructs were set to one; and the resulting one factor model-fit was compared to the theoretical model as well as to alternative models (Table 2). As indicated by fit statistics and the change of the Chi-Square values, the one factor model was inferior to the theoretical model. Another test for discriminant validity was to release the path between intentions and attitude toward booster seats and set the rest of the correlations to one. This model showed that the intention regarding using booster seats was a separate construct. However, the resulting model still had significantly worse fit indices than the theoretical model. Similarly, the attitudes toward booster seats were tested and found to be a distinctive construct. These results showed that the theoretical model had discriminant validity.

Table 2 – CFA Model Comparison for Discriminant Validity

if seven-factor model is correct, then:

Number of Factors	d.f.	Change in Chi-Sq.	p
One Factor	21	3918.73	0.000
Two Factors	15	2329.69	0.000
Three Factors	10	1111.58	0.000

The second stage of the analysis was confirmation of construct validity as a measure of convergent validity. One indication of this validity was the model fit. Table 3 shows the details of model fit and tests of the hypothesized relationships. Results indicated that the model fit was good. All items loaded significantly to their related constructs, indicating adequate construct validity.

Table 3: The Model Fit

Chi-Sq	1326.12
d.f.	615
Chi-Sq Ratio	2.156
CFI	0.922
RMSEA	0.053
AGFI	0.830
GFI	0.851

Table 4 is a summary of hypotheses and resulting path weights. Nine out of ten hypotheses were supported, showing a sound theoretical structure. All paths are significant and substantial except for the correlation between the attitude toward multi-tasking while driving and the attitude toward risk attraction. People in favor of banning such multi-tasking activities as talking on cell phones and eating while driving share a common personality trait of risk aversion, providing support

to the first hypothesis. The attitude toward the risk-attraction construct has no relationship with multi-tasking.

Table 4: Test of Hypotheses

Hypotheses	Path	Standardized Regression Weights	p
H1a: Supported	Attitude Toward Multi-Tasking ↔ Attitude Toward Risk Aversion	0.21	0.003
H1b: Not Supported	Attitude Toward Multi-Tasking ↔ Attitude Toward Risk Attraction	0.00	0.959
H2: Supported	Attitude Toward Risk Aversion ↔ Attitude Toward Risk Attraction	0.39	0.000
H3: Supported	Attitude Toward Risk Aversion → Attitude Toward Children	0.41	0.000
H4: Supported	Attitude Toward Risk Aversion → Attitude Toward Children While Driving	0.18	0.040
H5: Supported	Attitude Toward Risk Attraction → Attitude Toward Children	0.19	0.004
H6: Supported	Attitude Toward Risk Attraction → Attitude Toward Children While Driving	0.31	0.000
H7: Supported	Attitude Toward Children → Attitude Toward Children While Driving	0.21	0.003
H8: Supported	Attitude Toward Children While Driving → Attitude Toward Booster Seat	0.21	0.015
H9: Supported	Attitude Toward Booster Seat → Intention Toward Booster Seat	0.29	0.000

The attitudes of subjects toward risk aversion and risk attraction have strong positive effects on their attitude toward children and toward children while driving. Their attitude toward children also has a strong positive effect on their attitude toward children while driving. As theorized, their attitude toward children while driving has a strong positive effect on attitude toward booster seats. Moreover, alternative models with direct paths from the rest of the constructs—namely attitudes toward risk aversion, risk attraction, multi-tasking, and children—were also investigated. None of those models have significant paths to attitude toward booster seats and none generate a better fit for the data. Finally, their attitude toward booster seats has a strong direct effect on the intentions to buy and use booster seats.

DISCUSSION AND FUTURE RESEARCH

This preliminary research's results showed the importance of the parents' attitude towards children while driving as an influential construct on their attitude toward booster seats. Their intent to buy, use, and recommend a booster seat for children depends heavily on a positive attitude toward

booster seats. The key variable in forming a positive attitude towards booster seats was the subjects' attitude toward children while driving. This information was very important for the campaign's success. Target group of this campaign (K-4 students) was selected correctly. Communication activities need to focus on teaching children how to behave in a moving vehicle. By making buckling the "cool thing," the responsibility of buckling and staying buckled would belong to the children. As a result, parents will be under less stress while driving.

The attitude towards children while driving was found to be drastically different than the attitude toward children in general. In the attitude toward children construct, we learned what parents think, feel, and do about their children in general. Parents overwhelmingly stated that children were fundamental to their enjoying life. They felt good about their children and cared about their well-being. Parents also declared that they try to protect their children from potential dangers.

If the above statements are correct, why do some parents not buckle their children into booster seats? The attitude toward children while driving construct sheds some light on this dilemma. Sometimes these parents forgot to tell their children to buckle up. Once children thought it was ok not to buckle up, they stopped using their booster seat. This perception could have been further strengthened as some parents believed that when driving very slowly on a rural road, putting the child into booster seats was unnecessary. Some parents, on the other hand, let their children get out of the booster seat to stop them from whining in the car. Finally, still other parents believed their children could responsibly sit on any seat they chose, including the front seat next to driver.

The importance of the attitude toward children while driving construct indicated once more the Ollie Otter Seatbelt and Booster Seat Safety program's value. Thanks to this program, using booster seats has become "cool" among elementary school children. The parents' education about booster seats needs to be merged with this program because research indicates that educating children to buckle up in a booster seat every time they are in a vehicle *and* educating parents to consistently require their to ride in booster seats and buckle up are key factors in reducing children's injuries and death in vehicle accidents.

This research has also significantly contributed to the perceived risk literature in marketing. Conchar, Zinkhan, Peters and Olavarrieta (2004) suggested an integrated framework for the conceptualization of consumers' perceived risk processing. Their compiled literature on the perceived risk construct identified contradictory results in risk affinity (risk aversion) as a personality trait and propensity to take risks (risk attraction) research. They concluded that risk affinity is a static personality trait that shows a general tendency to seek or avoid risks (Dowling, 1986). Risk-taking propensity (risk attraction), on the other hand, was defined as a consumer's willingness to make a risky choice in a specific situation (Conchar et al., 2004). Our research provided some empirical support to this concept. Validity and reliability checks showed the two constructs were clearly separate. Both constructs have strong positive effects on attitude toward children while driving. We need to do more qualitative research to obtain an in-depth understanding of how these two constructs influence behavior; however, this preliminary investigation revealed

interesting outcomes. Individuals with a high risk-taking propensity while driving are likely to be aware of their actions and the potentially hazardous consequences. Therefore, they may be meticulous about driving safety by consistently requiring their children to sit in booster seats. Similarly, parents who are highly risk averse are likely to be equally meticulous about the safety of their children while driving, as indicated by their attitude toward using booster seats.

Researchers assumed that risk-seeking parents were likely to continue their risk-seeking behavior, but would be more cautious about their children's safety. A post-survey interview indicated that a skate-boarder parent did not stop skate boarding; instead, he took his children to skateboard with him, but bought helmets and knee and elbow pads for them. However, the above-mentioned assumption needs further investigation in relation to driving. Another interesting finding of this research is the lack of correlation between risk attraction and multi-tasking constructs. This finding requires further qualitative research to understand theoretical foundations of risk aversion, risk attraction and multi-tasking.

The current study's limitation was that respondents were predominantly female. A second wave of data collection is expected, however, to compensate for this limitation. As a result, model comparisons based on demographic variables will be performed. The current research objective was to learn parents' attitudes toward buying booster seats. At the same time, it also aimed to learn other attitudinal factors influencing this attitude. Future research is needed to understand other stakeholders' motivation regarding booster seats. Situational factors, such as state laws, peer pressure, and cost of booster seats, could also shed more light on the attitudinal model.

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