



COURT OF APPEALS  
EIGHTH DISTRICT OF TEXAS  
EL PASO, TEXAS

NABORS WELL SERVICES, LTD,	§	
F/K/A POOL COMPANY TEXAS, LTD,	§	
AND LAURO BERNAL GARCIA,		
	§	
Appellants,		No. 08-09-00319-CV
	§	
v.		Appeal from
	§	
ASUNCION ROMERO,		112th District Court
INDIVIDUALLY AND AS	§	
REPRESENTATIVE OF THE ESTATE		of Pecos County, Texas
OF AIDE ROMERO, DECEASED,	§	
AND AS NEXT FRIEND OF		(TC # 10319)
EDGAR ROMERO AND SAUL	§	
ROMERO, ESPERANZA SOTO,		
INDIVIDUALLY AND AS NEXT	§	
FRIEND OF ESPERANZA SOTO,		
GUADALUPE SOTO,	§	
MARIA ELENA SOTO, AND		
MARTIN SOTO,	§	
Appellees.	§	

**OPINION**

In this appeal we once again visit a tragic accident between a family traveling for the Christmas holidays and an oil field service vehicle. For the reasons noted below we reverse and remand in part, and affirm in part.

## PROCEDURAL HISTORY

This case returns to us from the Texas Supreme Court. On initial review, we affirmed the trial court which had excluded evidence related to the alleged non-use of seat belts by most of the Appellees. *Nabors Wells Services, Ltd. v. Romero*, 408 S.W.3d 39, 41 (Tex.App.--El Paso 2013), *rev'd*, 456 S.W.3d 553 (Tex. 2015). Appellants, who we collectively refer to as Nabors, sought to introduce evidence to show that the Appellees failed to use their seat belts, or failed to require others to use seat belts, which enhanced their injuries from the accident. We affirmed the trial court's exclusion of the evidence based on *Carnation Co. v. Wong*, 516 S.W.2d 116 (Tex. 1974) which was the controlling law at the time.

On petition for review, however, the Texas Supreme Court concluded that the rationale of *Carnation* was no longer viable in light of intervening legislative and societal changes. 456 S.W.3d 563. In overruling *Carnation*, the court held: "relevant evidence of use or nonuse of seat belts, and relevant evidence of a plaintiff's pre-occurrence, injury-causing conduct generally, is admissible for the purpose of apportioning responsibility under our proportionate-responsibility statute, provided that the plaintiff's conduct caused or was a cause of his damages." *Id.* at 566-67. That still leaves the question of whether this new rule requires a reversal in this case. The Texas Supreme remanded that issue for our consideration. *Id.* at 566.

We are generally faced with two questions in reviewing a trial court's decision to exclude evidence: was the exclusion error, and if so, was the exclusion harmful? *Gee v. Liberty Mutual Fire Insurance Co.*, 765 S.W.2d 394, 396 (Tex. 1989). The Texas Supreme Court's holding answers the first question for some of the excluded evidence in this case: if the evidence was excluded only on the basis of *Carnation*, the exclusion was error. But that leaves additional inquiries on remand: Was there any other valid basis for the exclusion of the evidence that the

trial court relied on, and for any improperly excluded evidence, was the exclusion harmful? Appellees believe the first question is particularly relevant here, as the trial court excluded Nabors' biomechanical expert, at least in part, based on TEX.R.EVID. 702 grounds as articulated in *E.I. du Pont de Nemours & Co. v. Robinson*, 923 S.W.2d 549 (Tex. 1995). Appellees also raise additional waiver issues which we did not address on first hearing the case. With that overview of the task before us, we turn to the evidence in the case.

### **FACTUAL BACKGROUND**

On December 20, 2004, Martin Soto was driving his family from California to Mexico for the Christmas holidays. They were traveling in a 1993 Chevrolet Suburban. Martin did all the driving and his wife, Esperanza, was in the front passenger seat. Their nine-year-old daughter, Marielena Soto, was in an aftermarket seat that had been installed between the front driver and front passenger seats.

The Suburban had two rows for passenger seating. The Sotos' fifteen-year-old twins-- Esperanza (who we will refer to by her nickname "Mino") and Guadalupe were in the middle row. Mino was most likely seated behind the driver's seat, and Guadalupe was seated behind the front passenger seat. In the back row, Martin Soto's stepdaughter, Aydee Romero, was in the middle seat. Her children, Edgar Romero and Saul Romero, were to either side of her. There is some dispute in the evidence as to which child was on the right and which on the left.

### **The Accident**

At about 4:30 a.m. the Suburban was headed Southbound on U.S. 285 just outside of Fort Stockton, which at that point is a two lane highway. The Suburban was overtaking a Nabors oil field service truck being driven by Lauro Garcia, which was also southbound. Martin moved into the on-coming lane of traffic to pass the slower moving Nabors vehicle. As he was passing

the Nabors truck, however, it began a left hand turn which caused the two vehicles to collide. Upon impact, the Suburban skidded to the side, rotated clockwise, and then began rolling over with driver's side leading the roll. It made three complete revolutions before coming to rest upright on its tires. A rollover with three complete revolutions would rank in the top 0.2 percent in terms of severity for such accidents.

Had the trial court allowed evidence about the use or non-use of seat belts, there would have been sharply disputed evidence about whether some of the occupants were belted. A Department of Public Safety report noted that all but Marielena and Esperanza Soto were unbelted at the time of the accident. Depositions taken in the case, however, yielded testimony that Esperanza, Marielena, and Mino were unbelted. There was also a dispute over who was ejected from the Suburban in the crash. The same DPS report concluded that only Aydee Romero was ejected. The DPS officer who completed the report, however, did not arrive on the scene until an hour and half after the accident. The EMTs on scene reported that one of the Appellees, likely Guadalupe, stated that all but one of the Appellees were ejected in the accident.

### ***The Injuries, Evidence of Seat belt Use, and Ejection***

We summarize each Appellee's injuries and the evidence about belt use and possible ejection from the Suburban.

#### *Martin Soto*

Martin Soto was belted and stayed in Suburban as it rolled over. Following the accident, he stayed at the scene until well after the other occupants of the Suburban were transported by ambulance. He later went to the Pecos County Hospital Emergency room and was evaluated for complaints of neck, rib, and shoulder pain. He was released that same day and introduced no evidence of follow up care.

*Esperanza Soto*

An EMT who arrived on the scene at 5:22 a.m. found Esperanza lying on the ground on her right side with multiple right side injuries. The EMT noted she was ejected from the vehicle and that she had “road rash” abrasions to her right side. The emergency room record states she was ejected from the vehicle, but she herself had no memory of the accident. Her husband testified that she was ejected. She fractured her pelvis and hip, broke several ribs on her right side, perforated a lung, and had a hairline fracture to the right shoulder. Nabors could have presented direct testimony that she was unbelted at the time of the accident.

*Marielena Soto*

Marielena was the first priority patient at the scene. By the time EMTs arrived, the fire department already had her on a backboard. She was assessed with possible fractures and a closed head injury; she was largely unresponsive. At Pecos Memorial Hospital, she was intubated and prepared for air transport to a pediatric ICU unit in Lubbock. She was still unresponsive by the time she arrived in Lubbock and remained on a ventilator for two days. She had a partially collapsed left lung. When she regained consciousness, she complained of left heel pain, which turned out to be a fractured calcaneus bone in her foot. Marielena had an orbital fracture from the head trauma which was sufficiently severe to cause a subdural hematoma and severe brain trauma. She lost vision in her right eye from the orbital fracture. The resulting frontal orbital syndrome led to a severe traumatic brain injury. Marielena was in the pediatric ICU unit in Lubbock for eleven days. Her medical record contains multiple references to an ejection after an automobile accident. Nabors could have presented some direct testimony that Marielena was unbelted.

*Mino Soto*

Mino was found by the EMTs lying on the street. She was minimally responsive and had a large abrasion on her right arm and shoulder. Her condition began to deteriorate while being transported to the local hospital. Once there, she was intubated and air-flighted to a pediatric ICU in Lubbock. She was diagnosed with a closed head injury resulting in a small subdural hematoma. She on a ventilator for two days and remained in the hospital a total of eleven days. Her discharge summary from the hospital notes that she was ejected in the accident. She had abrasions on both of her arms and face which a treating doctor agreed were consistent with road rash, which in turn is consistent with an ejection injury. She testified at trial to having a road rash scar. Multiple other medical records similarly recite that she was ejected. Nabors could have presented direct testimony that she was unbelted.

*Guadalupe Soto*

Guadalupe was found ambulatory at the scene by the EMTs. She had an avulsion injury to her finger (her finger nail was detaching from the finger and was removed) and she had a few scratches and cuts. While the ER physician believed she had been ejected, as did Martin, she testified that she was belted at the time of the accident.

*Aydee Romero*

The DPS report and depositions of all the participants agree that Aydee Romero was ejected from the Suburban. She died at the scene. Photos show her body lying on the pavement with apparent blood pooling around her head. One photo shows considerable abrasions to her body. The death certificate, completed by a local justice of the peace, reported the cause of death as blunt injuries to the head. The investigating DPS officer would have testified that Aydee was not wearing a seat belt at the time of the accident.

*Edgar Romero*

Edgar Romero, age eight, was found by the ambulance crew on the ground crying when they arrived on the scene. He complained of pain to his right shoulder and knee. Edgar was brought by ambulance to the emergency department of Pecos County Medical Center and was assessed with a fractured right clavicle and right knee injury. The emergency room record recites that he was ejected in the accident. The ER physician believed he had been ejected. Edgar was transferred to a hospital in Odessa that same day which confirmed the fractured clavicle. Guadalupe Soto testified that she helped Edgar out of the vehicle following the accident, but Edgar himself reportedly testified on deposition that he was ejected.

*Saul Romero*

Saul Romero suffered a fractured left clavicle, a small cut and bump to the left side of his head, and abrasion to his left hand. The Pecos County ER records reported he suffered an ejection injury. The only evidence of his seat belt use is found in the DPS report which stated he was unrestrained.

***The Seat Belt Defense and Exclusion of James Funk, PhD.***

Nabors pled that Martin Soto was contributorily negligent not only with regard to the cause of the accident, but also in “failing to assure that all passengers in his vehicle had their safety belts secured.” Nabors asserted this defense as both negligence and negligence *per se*. At the time of this accident, the Texas Transportation Code would have required Martin and Esperanza as front seat occupants to be belted. Act of June 14, 2001, 77th Leg., R.S., ch. 910, § 2, 2001 TEX.GEN.LAWS 1821, 1821-22 (amended 2005, 2007, 2009, 2013)(current version at TEX.TRANSP.CODE ANN. § 545.413(b)(West Supp. 2015). It also would have required Martin, as the driver, to have any child (of at least age four but younger than seventeen) anywhere in the

vehicle to be belted. *Id.*<sup>1</sup> Nabors' answer further alleged that each Appellee was contributorily negligent in not buckling themselves in. Under the heading "Failure to Mitigate," the pleading asserted that Nabors was not responsible for any injuries resulting from any person failing to secure their own safety belt, or failing to require their child to be secured in a safety belt. Appellees attacked this portion of Nabors' pleading through a partial motion for summary judgment which the trial court granted just before trial. It was that ruling which generally led to the exclusion of any reference to seat belts in the case.

Nabors was prepared to advance its seat belt defense through its designated expert, James Funk, PhD. Funk has a bachelor of science, master's, and doctorate degree in biomedical engineering. He described his field as the study of the relationship between forces and resulting injury patterns. As a part of his schooling, he took course work that both medical students and engineers might take, including chemistry, biology, anatomy, physiology, physics, biophysics, and mechanical engineering. In his master's degree program, he performed research at the University of Virginia Medical School's orthopedics department. As a part of his doctorate program, he worked in an automobile safety laboratory which intentionally injured cadavers to understand the relationship between the forces and ensuing injury.

He continued as a research scientist for UVA for several years until he began working for Biodynamic Research Corporation, where he investigates automobile crashes. Three-fourths of his time is spent on litigation matters. The other part of his work involves research, such as a

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<sup>1</sup> The pleading also asserted negligence *per se* under various California statutes, but the trial court never took judicial notice of those enactments, and Nabors does not assign that as error in its briefing to this court. Nabors does not explain how the California laws would apply to an accident in Texas. We also note the version of California law in effect at the time of this accident expressly provides that it cannot be used to establish negligence *per se*. See An Act to amend Section 27315 of the Vehicle Code, relating to vehicles. 2003 Cal. Legis.Serv. Ch. 521 (A.B. 1625)(West)("i) In a civil action, a violation of subdivision (d), (e), or (f) or information of a violation of subdivision (h) does not establish negligence as a matter of law or negligence *per se* for comparative fault purposes, but negligence may be proven as a fact without regard to the violation.").



government sponsored project on rollover crashes through the University of Virginia. By the time of this trial, his resume referenced fourteen peer reviewed articles that he co-authored on various aspects of biomechanics, including several on rollover accidents. The same resume referenced twenty-eight peer-reviewed conference publications and multiple other publications and invited presentations. He is not a medical doctor and would not be licensed to practice medicine in the State of Texas.

### **Dr. Funk's Opinions**

Dr. Funk's basic methodology starts with understanding the dynamics of how the vehicles move during the crash. From that, he determines the movement and forces applied to the occupants of the vehicle. Once he estimates the amount and direction of the biomechanical forces applied to the occupants, he then determines which injuries were caused by the accident. Following this methodology, he expressed several opinions in this case which we categorize as follows:

#### *Seat Belt Usage Opinions*

Dr. Funk reviewed the deposition testimony taken of the Appellees and other witnesses, the medical records, and accident reports from the case. He was prepared to summarize the evidence as to whether each Appellee was belted, and whether any particular Appellee was ejected from the Suburban. For instance, the DPS report states that Martin Soto was unrestrained, while Martin testified that he was belted, a fact also supported by the medical record entries. The DPS report noted that Esperanza Soto was not ejected and had her shoulder and lap belt engaged. The medical records and Esperanza's own testimony, however, contradicted the DPS report on both issues. There were similar disputes with all the Appellees,

other than everyone agreed that Aydee Romero was ejected. Dr. Funk prepared a chart as a part of his presentation which would have summarized the conflicting evidence on these topics.

Given these discrepancies, Dr. Funk was also designated to provide an opinion regarding what the physical evidence showed as to seat belt use. He had inspected the seat belts in the vehicle (three and one-half years post-accident) as well as the photographs taken after the accident. He concluded that the physical evidence was inconsistent with anyone but Martin wearing a seat belt. Martin's seat belt showed markings that matched up with a "D ring" on the seat belt assembly, which Dr. Funk interprets as "loading" from the force of Martin's body pulling on the belt during the accident. None of the other seat belts showed this loading. The other belts had markings and scuffs on the portion of the webbing that is exposed when the seat belt is retracted and not in use. The portion of the belt that would be exposed if it were engaged, however, was pristine and had no such marks. He also notes that he when inspected the vehicle, the seat belts for Marielena and Aydee were not adjusted properly to fit them (they would have been either too tight or too loose on the wearer).

#### *Physics Of Belted Versus Unbelted Passengers*

Dr. Funk also described the likely movements of Appellees' bodies during this accident. Consistent with an accident reconstruction expert, he divided the crash into two phases: an initial sideswipe of the Suburban and Nabors' truck, and then a second phase where the Suburban slides, rotates, and rolls over. With the first impact between the Suburban and the Nabors' truck, an occupant of the Suburban would move to front and left, and then possibly rebound from anything they may have struck. As the vehicle rotated and began to rollover, centrifugal force would have then dominated. The vehicle rolls in circular pattern. For the occupants to also move in that same circular pattern, they must either be restrained by a seat belt, or if not, by the

perimeter of the vehicle. In a rollover, the windows will often break from ground contact leaving a portal for ejection. If unrestrained, centrifugal force will push the occupants out of the vehicle.

An ejection can occur on the high side, throwing the occupant up and out in a ballistic trajectory. In that event, the occupant may be thrown beyond the path of the vehicle, land, and then slide until they come to a rest. An occupant can also be ejected on the low side, meaning they are left behind as the vehicle continues to roll. Dr. Funk was prepared to demonstrate these movements with a video of an actual crash, using six crash test dummies in an SUV. The video showed both high side and low side ejections of five of the six test dummies.

Dr. Funk was unable to conclude through which opening any particular Appellee would have been ejected. He did find evidence of ejection on the vehicle, such as hair on window openings. With regard to Aydee, he knew her final resting point and by working backwards, he was able to calculate eight possible trajectories that her body could have taken. They all resulted in a severe ground impact with the pavement at a speed between 30 to 47 miles per hour.

#### *Likelihood Of Ejection With And Without Seat Belts*

Dr. Funk also offered the opinion that seat belts are 99.9 percent effective in preventing ejections in rollover accidents. In crash tests, seat belts have never failed to prevent ejections. In the few real world instances of belted ejections that Dr. Funk has investigated, there was a significant force from the rear (a high speed rear end collision) which caused the seat back to fail. Conversely, Dr. Funk concluded that unbelted occupants have an 80 percent chance of ejection in a three-revolution rollover. This conclusion is based on various studies which we discuss in more depth below.

Dr. Funk made an exception to this analysis for Marielena who was in an aftermarket seat added between the two front seats. That seat had been purchased from Western Auto, and

installed by Martin. The seat back broke from the seat bottom which would have impaired the effectiveness of the seat belt.

### *Injury Potential Of The Accident*

The Suburban and the Nabors truck initially collided as the Nabors truck began its left hand turn. From the scene photos, the front bumper of the Nabors truck was torn off. As a part of Dr. Funk's analysis, he first attempted to estimate the severity and injury potential of this first impact. From information developed by an accident reconstructionist, he estimated the change in speed of the Suburban (which he refers to as "Delta V") as between five to ten miles per hour. He concluded that "the risk of serious injury in a minor frontal like this is very low. It's less than two percent." He based this opinion on one of his own studies done in 2008.<sup>2</sup>

Turning to the rollover phase of the accident, Dr. Funk calculated the centrifugal force experienced by the occupants as between three to six g-forces, equivalent to the same force one might feel on a roller coaster ride. He concluded that level of the g-forces in and of themselves would not likely cause any injuries. Roof collapse is another peculiar risk of rollovers. There is a high risk of injury if a person is pressed up against the relatively thin roof when it impacts the ground. He examined the roof of the Suburban and found "almost non-existent" damage. From this, he concluded there were no significant roof to ground impacts, and therefore a low risk of injury for occupants inside the vehicle. Dr. Funk acknowledged that the Suburban was carrying unrestrained luggage and cargo, which would have reacted just as an unrestrained person would have during the rollover. Because the items are moving in the same direction and speed as the occupants, he contends any risk of injury from the cargo striking an occupant is low. The

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<sup>2</sup> James R. Funk, Joseph M. Cormier, Hampton C. Gabler, *Effect of Delta-V Errors in NASS on Frontal Crash Risk Calculations*, Annual Proceeding of the Association for the Advancement of Automotive Medicine (2008) (hereinafter, "Funk 2008 Delta-V").

abrasion injuries sustained by the some of the Appellees here were also described as “road rash” which would be different from a compression injury caused by luggage striking someone.

Dr. Funk then concluded the most serious risk of injury facing the Appellees was an ejection injury. The risk of serious injury or death for a person ejected in a rollover is five to ten times higher than a non-ejected person. For rollovers, he concluded that the risk of serious injury or death is 10 percent for a non-ejected occupant, but is 70 percent for an ejected occupant. His analysis appears to be based on several studies that conclude that unbelted occupants suffer greater injuries in severe rollover accidents than belted passengers: Malliaris and Digges, 1987;<sup>3</sup> Parenteau and Shah;<sup>4</sup> Digges and Eigen, 2003;<sup>5</sup> Moore, 2005;<sup>6</sup> and Gloeckner, 2006.<sup>7</sup> He also relied on several more of his own papers.<sup>8</sup> We discuss each of these studies below.

Dr. Funk then attempted to tie in the specific medical conditions of each Appellee, as disclosed in the medical records, to his theory. Martin, who was restrained, suffered relatively minor injuries compared to the others. Conversely, Marielena, who was seated next to him but

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<sup>3</sup> A.C. Malliaris, Kennerly Digges, *Crash Protection Offered by Safety Belts*, Eleventh International Technical Conference on Experimental Safety Vehicles, U.S. Department of Transportation National Highway Traffic Safety Administration, May 12-15, 1987 pp 242-52. (hereinafter “Malliaris and Digges, 1987”).

<sup>4</sup> Chantel Parenteau and Minoos Shah, *Driver Injuries in US Single-Event Rollovers*, Society of Automotive Engineers, Paper 2000-01-0633 (2000) pp. 1-7. (hereinafter “Parenteau and Shah”).

<sup>5</sup> Kennerly Digges and Ana Maria Eigen, *Crash Attributes that Influence the Severity of Rollover Crashes*, Proceedings, 11th Enhanced Safety of Vehicles, Paper 231 (2003) pp. 299-308. (hereinafter “Digges and Eigen, 2003”).

<sup>6</sup> Tara L. Moore, Duane Steffey, Karuna Ramachandran, Catherine Corrigan, *Biomedical Factors and Injury Risk in High-Severity Rollovers*, 49th Annual Proceedings, Association for the Advancement of Automotive Medicine, September 12-14, 2005 pp.134-50. (hereinafter Moore, 2005).

<sup>7</sup> Claire Gloeckner, Tara L. Moore, Duane Steffey, Cleve Bare, Catherine Corrigan, *Implications of Vehicle Roll Direction on Occupant Ejection and Injury Risk*, 50th Annual Proceedings, Association for the Advancement of Automotive Medicine, Oct. 16-18, 2006 pp. 155-70. (hereinafter “Gloeckner, 2006”).

<sup>8</sup> James R. Funk, Peter Luepke, *Trajectory Model of Occupants Ejected in Rollover Crashes*, 2007 Society of Automotive Engineers World Congress” (hereinafter “Funk 2007”) and James R. Funk et. al., *Occupants Ejection Trajectory in Rollover Crashes: Full Scale Testing and Real World Cases*, 2008 Society of Automotive Engineers World Congress, April 14-17, 2008 (hereinafter “Funk 2008”).

was ejected, suffered a severe head trauma and showed signs of road rash from the impact. Similarly, Esperanza had a series of right side injuries (thorax, shoulder, pneumothorax, lung contusion, rib fracture) which were consistent with an impact with the ground on her right side. She had road rash on that side as well. Dr. Funk in his doctorate work had seen these kinds of injuries from cadaver studies. Esperanza also had a fractured hip; the x-ray report noted foreign bodies (glass fragments and stones) imbedded in the skin on the right hip. He excluded Esperanza striking her head on the front of the windshield based on the lack of fracture patterns on the windshield showing an impact point.

Dr. Funk tied Mino's injuries to his theory by noting her closed head injury and road rash abrasions which he concluded were impact injuries. He tied Aydee's injuries to his theory based on the impact injury to her head, which is listed on the death certificate as the cause of death. Based on cadaver studies, her calculated impact at 30 to 47 miles per hour was well in excess of that need to cause a catastrophic head injury. He further based his opinion on her position in a middle seat, where she would be otherwise protected from impacting the side of the vehicle. The absence of roof damage suggests she would have avoided a head injury had she stayed in her seat.

With regards to Edgar and Saul, who each had clavicle fractures on the right and left shoulder respectively, Dr. Funk believed those injuries were consistent with where he believes they were seated in the vehicle (on the right and left side respectively).<sup>9</sup>

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<sup>9</sup> "One thing I noticed was that they each had a clavicle fracture. Edgar on the right and Saul on the left. That is caused by a direct blow to the shoulder from the side, again, confirmed by biomechanical studies on cadavers, and these injury patterns are actually consistent with Edgar's testimony that he was seated on the third row right, and Saul was on the third row left, and they would be in a position to get impacts to those respective shoulders, outboard shoulders."

### **The Basis of the Challenge**

Appellees filed a pretrial motion challenging Dr. Funk's opinions. They generally asserted that his testimony did not meet the qualification and reliability requirements of TEX.R.EVID. 702. Part of the motion focused on Dr. Funk's employer, Biodynamic Research Corporation, and contended the opinions of other persons working for that company have been struck in other courts. Specifically with regard to Dr. Funk's opinions in this case, Appellees contended they would not assist the trier of fact because they contain "gaps" or are based on speculation. Appellees further alleged that Dr. Funk was not qualified to render a medical causation opinion because Dr. Funk is not a medical doctor, nor has he had practical experience in the field of medicine. The motion was also premised on Dr. Funk being trained in biomedicine, and not biomechanical engineering. Finally, Appellees challenged the underlying data that Dr. Funk relied on--the studies of rollover injuries--as failing the basic reliability standards found in Texas law.

### **The Trial Court's Ruling**

The trial court excluded Dr. Funk's opinions on "injury causation" because they would not "assist the trier of fact." This ruling included the statistical information on incidence of injury when a person is ejected versus not being ejected. Nor could Dr. Funk testify to the eight ejection scenarios for Aydee. The order the trial court later entered also excluded any testimony regarding Dr. Funk's inspection of the vehicle's seat belts. The court preserved his ability to testify to the mechanics of the rollover. At the same hearing, the trial court granted Appellees' partial summary judgment on the seat belt issue, which effectively excluded other evidence of seat belt use/non-use.<sup>10</sup>

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<sup>10</sup> Nabors included a bill with that other evidence which we briefly summarize. Appellees truck safety expert, Walter Guntharp, had testified that seat belts will "protect the passengers" in a vehicle 75 to 77 percent of the time,

### *The Verdict*

The jury returned a verdict assessing 51 percent of the fault to Nabors and its employee. The jury found Martin 49 percent at fault. Nabors did not request, nor did the charge contain any issue or instruction which would have permitted the jury to consider the failure to use seat belts by any Appellee. The jury awarded damages to each of the Appellees, other than to Asuncion. The individual awards to the other Appellees totaled just over \$2.3 million.

### **WAS EXCLUSION ERROR?**

#### *Waiver Issues*

At the outset, we address two waiver issues that Appellees advance. First, they contend that because Nabors failed to request an issue or instruction which would have allowed the jury to consider the seat belt defense, Nabors has waived any consideration of the issue on appeal. Nabors counters that once the trial court excluded its evidence, it had no right to ask for a jury question or instruction, and it has not waived its defense. We agree with Nabors.

A party is entitled to have an instruction or question submitted for any legally viable claim or defense which is supported by the pleadings and the evidence. TEX.R.CIV.P. 278; *Elbaor v. Smith*, 845 S.W.2d 240, 243 (Tex. 1992). Once the trial court excluded the seat belt evidence, and granted Appellees motion for partial summary judgment negating Nabors pled defense, it had no right to obtain an issue or instruction on the seat belt defense. *See Placencio v. Allied Indus. Intern., Inc.*, 724 S.W.2d 20, 22 (Tex. 1987)(no error in refusing instruction on

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though it is unclear what kind of accident this statistic relates to, or what kind of injuries were avoided. The treating doctors were also asked about seat belts. For instance, the specialist who saw Marielena for her loss of sight agreed that the severity of head trauma is related to the risk of blindness, but he did not state it caused her blindness. The pediatric surgeon who saw Marielena in Lubbock would have testified that a properly worn seat belt assists in protecting child passengers in a wreck, but he offered no specific opinion that any particular Appellee's injuries were preventable with seat belt use. The emergency room physician who triaged most of the Appellees in Fort Stockton would have testified that the failure of a child to wear a seat belt "should be" a contributing factor for a child being ejected. The state trooper who investigated the accident would have also testified that Texas law required anyone in the front seats to be belted and anyone in the vehicle under 17 years of age must be belted. He would have testified that Aydee was not wearing a seat belt at the time of the accident.



defense which the evidence did not support). If Nabors had no right to request a question or instruction on its seat belt defense, it likewise had no obligation to tender proposed questions or instructions on that defense. Appellees cite no precedent requiring such a tender, and we find none. Accordingly, we reject Appellees waiver claim based on the absences of tendered questions or instructions.

Next, Appellees contend that Nabors briefing is deficient in that it does not contain a specific issue regarding the exclusion of Dr. Funk. Under TEX.R.APP.P. 38.1(f): “[t]he brief must state concisely all issues or points presented for review. The statement of an issue or point will be treated as covering every subsidiary question that is fairly included.” To be clear, Nabors briefing specifically addresses the trial court ruling on Dr. Funk, and argues each of the Rule 702 grounds that Appellees raised below. The only deficiency is that there is not a separate issue on appeal addressed to that ruling. We disfavor disposing of appeals for harmless procedural defects. *Verburgt v. Dorner*, 959 S.W.2d 615, 616 (Tex. 1997). We also construe appellate briefs reasonably, yet liberally, so that the right to appellate review is not lost by waiver. *See El Paso Natural Gas v. Minco Oil & Gas, Inc.*, 8 S.W.3d 309, 316 (Tex. 1999). Appellate courts should reach the merits of an appeal whenever reasonably possible. *See Verburgt*, 959 S.W.2d at 616. Accordingly, we decline to find a waiver here and believe the issue of Dr. Funk’s exclusion is a subsidiary question which has been fairly raised. *See Perry v. Cohen*, 272 S.W.3d 585, 587 (Tex. 2008)(finding no waiver when the issue raised did not specifically challenge trial court’s interlocutory order but the arguments under the issue did.). According, we turn to the merits of the issue.

### *Exclusion of Dr. Funk's Opinions*

We review a trial court's rulings on the admissibility of evidence for an abuse of discretion, including evidentiary rulings on expert testimony. *Helena Chem. Co. v. Wilkins*, 47 S.W.3d 486, 499 (Tex. 2001); *Broders v. Heise*, 924 S.W.2d 148, 153 (Tex. 1996). "The test for abuse of discretion is whether the trial court acted without reference to any guiding rules or principles." *Robinson*, 923 S.W.2d at 558.

With regard to experts, those guiding rules and principles are found in TEX.R.EVID. 702 which provides:

A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue.

*Id.*<sup>11</sup> Rule 702 requires at least three predicates: the witness must be *qualified*; the opinion must be *relevant*; and the opinion must be based on a *reliable* foundation. *See Wilkins*, 47 S.W.3d at 499; *Robinson*, 923 S.W.2d at 556.

In deciding whether an expert is *qualified*, the trial court must ensure they truly have expertise concerning the "actual subject about which they are offering an opinion." *Cooper Tire & Rubber Co. v. Mendez*, 204 S.W.3d 797, 800 (Tex. 2006), *citing Gammill v. Jack Williams Chevrolet, Inc.*, 972 S.W.2d 713, 719 (Tex. 1998). The test is whether the expert has the "knowledge, skill, experience, training, or education" regarding the specific issue before the court which qualifies the expert to give an opinion on that very subject. *In re Commitment of Bohannon*, 388 S.W.3d 296, 305 (Tex. 2012). The test mandates some flexibility. In *Broders v. Heise*, for instance, the court held that simply because an emergency room physician was a

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<sup>11</sup> In this opinion, we will refer to the restyled versions of Rule 702 which became effective April 1, 2015. *See* Tex.Sup.Ct. Misc. Dkt. No. 15-9048 (March 10, 2015), at 41. The "restyling changes are intended to be stylistic only." *Id.* at 1.

medical doctor, he was not necessarily qualified to testify that the conduct of a neurologist caused an injury. But nor did the rule mandate that only a neurologist would be so qualified. 924 S.W.2d at 152-153; *see also Roberts v. Williamson*, 111 S.W.3d 113, 122 (Tex. 2003)(pediatrician in that case *was* qualified to testify to cause and effect of neurological injuries); *In re Commitment of Bohannon*, 388 S.W.3d at 307 (reversing trial court’s exclusion of counselor who was offered to testify about future dangerousness only because witness was not a licensed psychologist or medical doctor).

Expert opinion testimony is *relevant* when it is “sufficiently tied to the facts of the case [so] that it will aid the jury in resolving a factual dispute.” *Robinson*, 923 S.W.2d at 556 (citation omitted). The requirement incorporates traditional relevancy analysis under TEX.R.EVID. 401 and 402. *Robinson*, 923 S.W.2d at 556. Simply put, irrelevant evidence is of no assistance to the jury. *Id.*

Rule 702 also requires an expert’s testimony to be *reliable*. *Robinson* identifies six factors useful in determining reliability: (1) the extent to which the theory has been or can be tested; (2) the extent to which the technique relies upon the expert’s subjective interpretation; (3) whether the theory has been subjected to peer review and/or publication; (4) the technique’s potential rate of error; (5) whether the underlying theory or technique has been generally accepted by the relevant scientific community; and (6) the non-judicial uses which have been made of the theory or technique. *Robinson*, 923 S.W.2d at 557. These factors are non-exclusive as Rule 702 requires a flexible inquiry. *Id.* (the factors “will differ with each particular case.”).

Subsequent case law dictates that reliability is based on more than just satisfying the *Robinson* factors. *Gharda USA, Inc. v. Control Solutions, Inc.*, 464 S.W.3d 338, 348-49 (Tex. 2015); *Volkswagen of Am., Inc. v. Ramirez*, 159 S.W.3d 897, 904-05 (Tex. 2004). Expert

testimony might also be unreliable if “there is simply too great an analytical gap” between the data on which the expert relies and the opinion offered. *Gammill*, 972 S.W.2d at 726, quoting *Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 146, 118 S.Ct. 512, 519, 139 L.Ed.2d 508 (1997). “Whether an analytical gap exists is largely determined by comparing the facts the expert relied on, the facts in the record, and the expert’s ultimate opinion.” *Gharda*, 464 S.W.3d at 349. Analytical gaps arise when experts improperly apply otherwise sound principles and methodologies, the expert’s opinion is based on incorrectly assumed facts, or the expert’s opinion is based on tests or data that do not support the conclusions reached. *Gharda*, 464 S.W.3d at 349 (citation omitted). A court is “not required . . . to ignore fatal gaps in an expert’s analysis or assertions that are simply incorrect.” *Volkswagen*, 159 S.W.3d at 912; *Cooper Tire & Rubber*, 204 S.W.3d at 800-01. But however these issues may play out, it is not the court’s role to decide if the expert’s opinions are correct, only that they are reliably formed. *Exxon Pipeline Co. v. Zwahr*, 88 S.W.3d 623, 629 (Tex. 2002).

Dr. Funk offered opinions in a field generally described as biomechanics.<sup>12</sup> Biomechanics is “the study of the application or relation of the laws of mechanics to the body.” 2 J.E. Schmidt, *Attorney’s Dictionary of Medicine*, B-115 (2004); see also *Eskin v. Carden*, 842 A.2d 1222, 1228 (Del. 2004) (“Admissible biomechanical testimony bridges the gap between the general forces at work in an accident determined by physical forces analysis (whether it be ‘physics’ or ‘engineering’) and the specific injuries suffered by the particular person who was

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<sup>12</sup> Appellees place great emphasis on Dr. Funk being trained in biomedicine and not biomechanics. The Department of Labor, Bureau of Labor Statistics, describe a biomedicine engineer as one who analyzes and designs solutions to problems in biology and medicine. Occupational Outlook Handbook, Biomedical Engineers, <http://www.bls.gov/ooh/architecture-and-engineering/biomedical-engineers.htm#tab-4> (last visited October 6, 2015). They perform a number of tasks, including working with life scientists, chemists, and medical scientists to research engineering aspects of biological systems of humans and animals. *Id.* While some biomedical engineers may design medical instruments and devices, others conduct research needed to solve clinical problems. *Id.* “They often serve a coordinating function, using their background in both engineering and medicine . . . . The work of these engineers spans many professional fields. . . . [S]pecialty areas within the field of biomedical engineering: *biomechanics* . . . .” [Emphasis added.] *Id.*

affected by those forces.”); *Smelser v. Norfolk S. Ry. Co.*, 105 F.3d 299, 305 (6th Cir. 1997)(biomechanics applies the principles in mechanics to the facts of a specific accident and provides information about the forces generated in that accident “[to] explain how the body moves in response to those forces, and thus determine what types of injuries would result from the forces generated.”).

Biomechanical experts are commonly designated when a plaintiff or defendant wish to prove that a particular kind of injury might or might not result from an auto collision at a particular speed. *E.g. Nash v. Gen. Motors Corp.*, 153 P.3d 73, 75 (Okla.App.Div. 1 2006); *Eskin*, 842 A.2d at 1227. Biomechanical experts also appear in cases when a driver is attempting to prove that the *malfunction* of seat belt enhanced their injury from an accident. *E.g. Smelser* 105 F.3d at 301; *Rangel v. Lapin*, 177 S.W.3d 17, 22 (Tex.App.--Houston [1st Dist.] 2005, pet. denied)(“To prevail in a passive restraint products liability suit, some combination of expert medical, biomechanical, and/or design opinions” was necessary to prove defect and causation). And as here, biomechanical experts are used when the defendant attempts to demonstrate a plaintiff’s injury was caused by the *failure to use* a seat-belt.

#### *Was Dr. Funk Qualified?*

At the outset, we dispose of one position advanced by the Appellees in this case: “Injury causation requires medical testimony from a doctor with credentials showing he is qualified to give testimony on the particular type of injury sustained.” In effect, the Appellees argue that unless a medical doctor is willing to state a medical opinion about the effect of the use or non-use of seat belts, a party fails to meet their causation burden. We think that goes too far.

The intersection of overlapping areas of expertise is fertile ground for conflict. In *Guentzel v. Toyota Motor Corp.*, 768 S.W.2d 890, 899 (Tex.App.--San Antonio 1989, writ

denied), for instance, the plaintiff took the exact opposite position as Appellees here. In that case they argued that a doctor was *unqualified* to express seat belt causation opinions, and that only a biomechanical expert would suffice. The court noted that the “engineers possess an extensive data base dealing with injury and cause. It is clear that their testimony could assist the jury.” *Id.* But the court was unwilling to restrict causation opinions only to the field of biomechanics:

Essentially then, we have a situation where a biomechanical engineer, who is not a doctor, can testify as to the cause of injuries and a medical doctor, with experience with lap belt injuries, cannot. Not only is this not logical, but it is also not within the framework of the expert witness rule. As the engineer could assist the jury with the technical viewpoint, so could Dr. McFee, with the medical viewpoint. In a case of this nature, the jury should have been presented with both.

*Id.* at 899 (applying pre-*Robinson* law). That same tension is evident on this record where the treating doctors were apparently uncomfortable expressing opinions about what injuries would or would not have occurred but for the failure to use seat belts. They instead were willing to defer to a biomechanical expert.<sup>13</sup>

Moreover, some prior Texas cases have allowed properly qualified non-physicians to render opinions touching upon the medical field. For instance, a properly qualified non-physician can opine on a medical standard of care question. *Bilderback v. Priestley*, 709 S.W.2d 736, 741 (Tex.App.--San Antonio 1986, writ ref'd n.r.e.)(non-physician professor of biophysics could testify about “the mechanics, forces and effects of weights used in administering physical therapy[.]”); *Johnson v. Hermann Hosp.*, 659 S.W.2d 124, 126 (Tex.App.--Houston [14th Dist.] 1983, writ ref'd n.r.e.)(former RN, based on her experience, could testify to standard of care of use of endotracheal tube). The opinion can extend to medical causation questions. *Ponder v.*

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<sup>13</sup> Dr. Blewett, who treated Marielena and Mino, testified that he asks and is interested in the mechanics of injury. For an ejection injury, he focuses on head trauma, spinal injuries, and long bone fractures because “someone coming out of the vehicle becomes a projectile.” Nonetheless, it would be “very difficult” for him to ascribe any particular injury to an ejection and impact with the road as distinct from the rollover itself.

*Texarkana Memorial Hosp.*, 840 S.W.2d 476, 477-78 (Tex.App.--Houston [14th Dist.] 1991, writ denied)(non-physician PhD may qualify as a medical expert on the cause of brain damage). *Broders* itself recognizes this line of cases. 924 S.W.2d at 153-54. To be sure, the non-physician must be qualified on the very issue before the court. In *Quiroz ex rel. Quiroz v. Covenant Health System*, 234 S.W.3d 74, 86 (Tex.App.--El Paso 2007, pet. denied), we affirmed the exclusion of testimony from a hospital administrator on how administrative policy could have led to a patient's brain injury. We did so because the administrator had no specific training or experience in the diagnosis of brain injuries. *Id.* When non-physicians have been allowed to give medical opinions, they have demonstrated training or experience on the precise question at issue. *Ponder*, 840 S.W.2d at 477-78 (non-physician expressing opinion on brain injury conducted research on the causes of neurological injuries and taught neurophysiology, neuroanatomy, and neurochemistry to MDs and PhDs); *Bilderback*, 709 S.W.2d at 741 (witness was professor of biophysics who taught physical therapy students how to do task at issue).

Appellees primarily rely on the Texas Supreme Court's decision in *Gammill v. Jack Williams Chevrolet, Inc.* for the proposition that an engineer, even if highly qualified, cannot render medical causation opinions. *Gammill* included a claim that an alleged failure of a seat belt led to the death of a passenger in a crash. *Id.* at 715. To support that claim, the plaintiffs designated Ronald Huston, a well-educated and experienced professional engineer, who had conducted research in biomechanics, vehicle occupant kinematics, and vehicle occupant restraint systems. He had tested vehicle restraint systems and had presented and published extensively on the topic. Nonetheless, the trial court struck his opinion that a seat belt was defectively designed, and consequently, the vehicle occupant received a fatal head injury. *Id.* at 716-17. The Texas Supreme Court concluded that Huston was in fact qualified to testify about

the design issues and failure of the seat belt system. But in addressing his qualifications, the court noted: “Huston, too, lacks any qualifications to testify concerning the cause of [the occupant’s] death.” *Id.* at 719. Causation, however, was not an issue before the court as it had not been raised in the summary judgment which led to the appeal. *Id.* at 720.

While Appellees here reason that Dr. Funk is relatively less qualified than was Huston, and thus should similarly be disqualified from rendering any causation opinion, we disagree. The opinion in *Gammill* does not disclose Huston’s specific qualifications on the causation issue, nor would we expect it to because causation was not an issue before the court. We do not know, for instance, if Huston based his causation opinion on the kind of studies that Dr. Funk has both performed and relied on here. We cannot read the single sentence in *Gammill* as a blanket prohibition on engineers testifying to any causation issue that touches upon medicine.

In surveying how other courts have viewed this issue, the majority have reached a middle ground which recognizes that a properly qualified biomechanical expert may express an opinion as to how forces act on the human body during a collision and the type of injuries that can be sustained from those forces. *Smelser*, 105 F.3d at 305 (noting expert’s admission that “biomechanics are qualified to determine what injury causation forces are in general and can tell how a hypothetical person’s body will respond to those forces . . . .”); *Berner v. Carnival Corp.*, 632 F. Supp. 2d 1208, 1212-13 (S.D. Fla. 2009)(biomechanical expert may give an opinion about the energy involved and whether the energy is *sufficient* to have caused an injury of the type alleged to have been suffered). But most courts then draw a line preventing a biomechanical expert from testifying that a particular victim’s injury was or was not caused by the forces in that particular accident. *Kelham v. CSX Transp., Inc.*, No. 2:12-CV-316, \_\_\_F.Supp.3d\_\_\_, 2015 WL 4426027, at \*6 (N.D. Ind. July 17, 2015)(expert “may testify about the forces involved in the



accident and, in general, what injuries those forces were expected to cause. Therefore, he may indicate what types of injuries were likely to occur based on the forces involved in this accident. However, [he] may not testify about the specific cause for . . . [plaintiff's] specific injuries.”); *Roach v. Hughes*, 4:13-CV-00136-JHM, 2015 WL 3970739, at \*11 (W.D.Ky. June 30, 2015)(noting that biomechanical engineers are qualified to testify in general terms that “X” forces would generally lead to “Y” injuries and “Y” injuries are consistent with those the persons incurred); *Berner*, 632 F. Supp. 2d at 1212-13 (“Dr. Williams may testify that the ‘energy on Berner’s head upon striking the floor was sufficient to have caused his mild to moderate traumatic brain injury.’ Dr. Williams will not testify that Berner *has* a mild to moderate traumatic brain injury--or a brain injury at all. She will not testify that Berner’s brain injury (if any) *was caused* by his head striking the floor.”); *Wagoner v. Schlumberger Tech. Corp.*, No. 07-CV-244-J, 2008 WL 5120750, at \*1 (D.Wyo. June 19, 2008)(“[Biomechanics experts] may, for example, testify as to the forces involved in the ... accident and how those forces may affect an individual or object; they may not express any opinions regarding whether plaintiff . . . has suffered a brain injury . . . or as to the . . . cause of the alleged brain injury.”); *Morgan v. Girgis*, No. 07 Civ.1960 (WCC), 2008 WL 2115250, at \*5-6 (S.D.N.Y. May 16, 2008)(while biomechanical expert could testify to the “observed . . . force on a human body in comparable accidents . . . he may not testify as to whether the accident caused or contributed to any of plaintiffs injuries.”); *Bowers v. Norfolk S. Corp.*, 537 F.Supp.2d 1343, 1377 (M.D.Ga. 2007) (“[A biomechanical engineer] may testify as to the effect of locomotive vibration on the human body and the types of injuries that may result from exposure to various levels of vibration . . . [H]e may not offer an opinion as to whether the vibration . . . caused Plaintiff’s injuries.”); *Shires v. King*, No. 2:05-CV-84, 2006 WL 5171770, at \*3 (E.D.Tenn. Aug. 10, 2006)(“[The

biomechanical engineer] clearly should be allowed to testify regarding the forces applied to plaintiff's head . . . and how a *hypothetical* person's body would re-pond [sic] to that force. He cannot offer opinions, however, 'regarding the precise cause' of plaintiff's injury.'").

In other cases, the biomechanical experts have testified to the causation of plaintiff specific injuries, but it is unclear if any objection was made to the scope of the expert's testimony. *Walker v. Ford Motor Co.*, \_\_\_ P.3d \_\_\_, 2015 WL 5260382, at \*7 (Colo.Ct.App. September 10, 2015)(“Paul Lewis, a biomechanical engineer and expert on injury causation, testified that, if Walker's seat back had remained upright in the accident and the seat had had an adequate headrest, Walker would not have sustained any of his more significant injuries.”); *Gaertner v. Holcka*, 580 N.W.2d 271, 274 (Wis. 1998)(“Dr. Joel Myklebust, a qualified biomechanical engineer expert witness, opined that Koldeway's damages would have been reduced substantially had Koldeway been wearing a seat belt at the time of the accident. According to the expert, 75 percent of Koldeway's injuries were caused by the failure to wear a seat belt and 25 percent were caused by the accident.”); *Waterson v. Gen. Motors Corp.*, 544 A.2d 357, 361 (N.J. 1988)(“Mr. Montalvo testified in detail concerning the injuries sustained by plaintiff. He also testified about . . . the specific causes of each of plaintiff's injuries, and the specific parts and surfaces of the car's interior with which plaintiff came into contact during the crash. . . . Ultimately, his opinion was that plaintiff would not have sustained any of her injuries had she been wearing her seat belt at the time of the accident.”).

We need not align ourselves with any specific approach because the exact phraseology of Dr. Funk's opinion was not at issue below. We conclude that Texas law does not *per se* disqualify a properly qualified biomechanical expert, who otherwise meets the requirements of Rule 702, from expressing opinions that will assist the jury in deciding injury causation

questions. If the trial court had based its exclusion of Dr. Funk on the Appellees' more absolutist contention, we think it would have erred to do so. That is to say, the trial court in its discretion might properly scrutinize how Dr. Funk parses his opinion that a particular Appellees' injury was caused by ejection. But it would go too far to restrict all his opinions surrounding that issue merely because he does not hold a medical degree. A properly qualified biomechanical engineer, with the proper foundation and analysis, may explain why and to what degree certain injuries are more likely experienced in rollover accidents when a person fails to use a seat belt.

Appellees' other qualification challenge urged that Dr. Funk's affiliation with Biodynamic Research Corporation indicates a bias which should factor into the Rule 702 analysis. Evidence that an expert principally works to generate opinions for litigation is indeed one of the *Robinson* factors. 923 S.W.2d at 557. However, Appellees attempt to prove this bias by referencing trial court orders where *different* experts from Dr. Funks' organization have been struck or limited in their testimony is singularly unhelpful in a Rule 702 challenge.<sup>14</sup> By the same token, we observe that Nabors' citation to multiple cases where those experts have been allowed to testify is no more persuasive. Whether another expert affiliated with Dr. Funk was successfully or unsuccessfully challenged does not address Dr. Funk's qualifications or methodology. Orders from other cases would not be particularly useful unless the complete context of those other cases is known, and none is developed in the record here. Nor would we or any trial court likely have the resources to painstaking compare the facts, conclusions, methodology, or opinions generated by an expert in one case with that in another. Other than the relatively rare instance when our supreme court, or one of our sister courts of appeals have

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<sup>14</sup> Even at that, the orders are included as attachments to Appellees Sur-Reply Brief to this Court, which is not an appropriate method to supplement a record. *Robb v. Horizon Communities Improvement Ass'n, Inc.*, 417 S.W.3d 585, 589 (Tex.App.--El Paso 2013, no pet.)("It is well established that documents attached to an appellate brief which are not part of the record may generally not be considered by the appellate court.").

specifically addressed the expert before us on similar facts, with similar methodological challenges, merely reciting that another court has struck or allowed an expert is little more than a make-weight argument.

Returning to the Rule 702 framework, we first look to qualifications. From his undergraduate, master's, and doctorate course work, Dr. Funk has an educational basis to testify to the basic biology and physics principles germane to his opinions. He now in fact teaches aerospace medicine to resident doctors at the U.S. Air Force School of Aerospace Medicine. By performing tests on cadavers in his doctorate program, he has the experience and training to testify to the kinds of injuries that the body experiences with different forces. His published works in the area of rollover accidents and the physics of ejections provide some proof of his experience to testify about what happens to a body during a rollover. His publications include actual studies on test dummies in rollover accidents that document the movements of the body and the likely impact points, both within and outside the vehicle. Other than an opinion which might include the diagnoses of any particular Appellee's specific medical condition, we conclude that Dr. Funk is qualified to render the opinions that he does here.

*Are Dr. Funk's Opinions Relevant?*

The second requirement for the admission of Dr. Funk's opinions is relevance. Given the trial court's ruling that the seat belt defense was unavailable to Nabors, his opinions in the first trial would have failed that test. In light of the change in the law, we think it evident that his opinions would be relevant. If proven, they might allow a jury to conclude that Martin was more responsible for some of the other Appellees' injuries than was Nabors. Similarly, a jury might believe that Aydee failed to act as a reasonable person in failing to wear a seat belt, even though not required by law to do so at the time. Even the minors could be held responsible to that

degree of care commensurate with their age. *See Rudes v. Gottschalk*, 324 S.W.2d 201, 204 (Tex. 1959).<sup>15</sup>

**Are Dr. Funk's Opinions Reliably Formed?**

The last hurdle for Nabors is the reliability of the opinions. We address each opinion in turn.

*Wearing Seat Belts or Not?*

The trial court excluded Dr. Funk from testifying about the “results and/or opinions formed from his personal inspection of the seat belts in the Plaintiff’s vehicle.” His observations and opinions in this regard were all germane to whether the Appellees were wearing their seat belts. It is unclear whether this portion of the order was based on the trial court’s exclusion of seat belt evidence in general, or some specific *Robinson* rationale. To the extent it was the latter, we find no sound basis for excluding all of those opinions.

Appellees motion challenging Dr. Funk does not specifically address his opinions on the examination of the vehicle’s seat belts. The only real question raised by Appellees at the hearing regarding the inspection of the vehicle was that it took place some three and one-half years after the accident. They suggest that the condition of the vehicle, which was stored in a legal counsel’s warehouse, could have changed over that time. Nonetheless, there is no *evidence* in the record to suggest there was an alteration of the seat belts after the accident. This is the type of challenge which goes to the weight and not the admissibility of the evidence. *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 596, 113 S.Ct. 2798, 125 L.Ed.2d 469 (1993) (“Vigorous cross-examination, presentation of contrary evidence, and careful instruction on the

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<sup>15</sup> The one exception might be Saul who may have been four years old at the time and thus incapable of having committing contributory negligence. *Yarborough v. Berner*, 467 S.W.2d 188, 190 (Tex. 1971)(child who was four years and ten months old was incapable of negligence as a matter of law). Nonetheless the record is unclear as to his age at the time of the accident, with some medical record references putting him at four, five, and six years old.

burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence.”). Nor do Appellees raise any specific concerns regarding the “loading” analysis that Dr. Funk used to reach his opinion. To the extent this evidence was excluded on *Robinson* grounds, the trial court abused its discretion in doing so.<sup>16</sup>

### *Injury Causation*

The trial court excluded any opinion dealing with injury causation, to include the general likelihood of injury from ejection, whether the Appellees’ specific injuries were from ejection, and whether any Appellee would not have been injured if they were wearing seat belts.

With regard to injury causation, Dr. Funk’s methodology in part relied on empirical studies which attempt to show relevant injury patterns for certain types of accidents. This is a methodology typically employed by biomechanical engineers. See *Thorndike v. DaimlerChrysler Corp.*, 266 F.Supp.2d 172, 184 (D. Me. 2003). The methodology is analogous to the use of epidemiological studies in chemical exposure cases as outlined in *Merrell Dow Pharm., Inc. v. Havner*, 953 S.W.2d 706, 713 (Tex. 1997). In those types of cases, parties sometimes attempt to prove causation by identifying population studies which show an association between exposure to a particular substance and some disease or condition (thus establishing general causation). See *Bostic v. Georgia-Pacific Corp.*, 439 S.W.3d 332, 351 (Tex. 2014). The party then will attempt to show that the particular plaintiff closely fits the same parameters as the persons and exposure at issue in the population study (thus establishing specific causation). *Id.* Similarly, Dr. Funk attempted to establish through studies on large numbers of vehicular accidents that the failure to wear seat belts generally results in ejection in

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<sup>16</sup> Dr. Funk also supported this opinion by noting that accident scene photos showed the belts in a stowed/retracted position. We agree that if this were the only basis for his opinion, it might lack reliability because the photos would be equally consistent with the Appellees being unbuckled after the vehicle came to rest.

serious rollover accidents, and ejections generally leads to more serious injuries or death. He then attempted to show how each particular Appellee fits the pattern in the studies.

*Havner* does not universally apply to all tort cases where causation is an issue. *Bostic*, 439 S.W.3d at 347-48. Instead, it is an alternative method of establishing causation “[i]n the absence of direct, scientifically reliable proof of causation.” *Id.* For this accident, there were no eyewitnesses, and certainly none that could identify which of the Appellees’ injuries were caused from impact with the ground as distinct from impact with the vehicle interior. Some of the Appellees had no recollection of the accident or memory until they later awoke in a hospital. Nor would it be realistic to expect a person tumbling inside (or outside) a vehicle to identify which specific blow caused their own injuries, much less those of the other occupants. No one suggested that the accident itself could be re-created with such precision to determine the particular forces and precise movements of the Suburban’s occupants. The situation therefore lends itself to one of those situations where *Havner* type studies might assist in demonstrating general causation.

One teaching from *Havner* is that scientific studies must be scrutinized by the courts to ensure they meet minimal reliability thresholds. *Havner* itself discussed the importance of epidemiological studies showing more than a doubling of the risk (also described as a demonstrating a “relative risk” or “odds ratio” of more than 2.0). 953 S.W.2d at 715-18, 721. A single study by itself would not suffice to establish legal causation. *Id.* at 718-19, 727. The study must show other indicia of scientific validity, such as an adequate sample size, an accounting for confounding variables, and a proper confidence interval. *Id.* at 724. Courts should be skeptical of scientific evidence which is neither published nor peer reviewed. *Id.* at 727. “A related factor . . . is whether the study was prepared only for litigation.” *Id.* at 726. And once

the study showing general causation is accepted, the party must show that their circumstances are similar to the group analyzed in the study. *Bostic*, 439 S.W.3d at 347.

Before turning to the specific studies upon which Dr. Funk relied, we note a few considerations governing these studies. First, most of the authors agree that rollover accidents are complex events. Gloeckner, 2006 at p.155; Moore, 2005 p.134 Even in a study where a specific type of vehicle was rolled over in a controlled manner--the same way each time--the test dummies in the vehicle reacted differently in different tests. G.S. Bahling, et. al., *Rollover and Drop Tests--The Influence of Roof Strength on Injury Mechanics Using Belted Dummies*, Proceedings 34th Stapp Car Crash Conference, Paper 902314, pp.101, 108 (1990). There are several variables which come into play. The number of quarter turns in the roll can affect the risk of injury. Moore et. al. 2006 at 134. The more quarter turns, the greater the likelihood of serious injury. *Id.* Moreover, the position of a person in the vehicle, and direction in which the vehicle rolls is apparently significant. For instance, when the driver's side leads the rollover, the occupant of the front passenger seat (who is in the following or "trailing" side) have shown more serious injuries in some studies. Gloeckner, 2006 p.156.

Most of the studies presented in this case are based on data from the National Accident Sampling System/Crashworthiness Data System (NASS-CDS) which is a sampling of nationwide police reports in tow-away crashes. The database was created for use by the National Traffic Highway Safety Administration. The NASS-CDS database has information on the kind of accident (i.e. rollover, single impact, etc.) and the kind of injuries that each driver or passenger experienced. The injury data is reported under a uniform system called the Abbreviated Injury Scale (or AIS). Under that system, a reviewer identifies the body part injured and then assigns a numerical severity rating from one to six. As an example, a minor injury to



the head would have an AIS-1 rating for the head. A serious injury to the thorax would be rated as an AIS-3 or higher for the thorax.

Dr. Funk initially relied on the Parenteau and Shah study for the opinion that seat belts are 99 percent effective in preventing ejections. The study collected NASS-CDS data from 1992-1996 on single event crashes resulting in a rollover. A total of 608 rollover accidents were included which the authors described as “relatively small” sample size. The study divided the data into  $\frac{1}{4}$  to  $\frac{1}{2}$  rolls,  $\frac{3}{4}$  to 1 rolls, and more than 1 complete roll. The overall conclusion of the study is that less than 1 percent of belted drivers were partially or fully ejected. For the unbelted drivers, 27 percent were completely or partially ejected.<sup>17</sup> Dr. Funk further supported this opinion with his own experience in staged rollovers with test dummies, where no ejection with a belted test dummy has ever been observed.

Dr. Funk also offered the opinion that 80 percent of unbelted occupants are ejected in three revolution rollovers. For this proposition, he relied on Moore et. al. 2005 and Gloeckner, 2006. The Moore study looked at NASS-CDS data for 1995 to 2003, using only rollover accidents involving 1990 or later model year vehicles. This subset of the NASS-CDS data included 4,024 rollover vehicles which were further subdivided into categories based on the number of quarter turns. The authors reference a 95 percent confidence interval. They concluded that unrestrained occupants had a greater than 80 percent chance of full or partial ejection in three revolution rollovers, compared to approximately 10 percent for restrained occupants.

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<sup>17</sup> The Texas Supreme Court cited to a paper by the National Highway Traffic Safety Administration for the proposition that seat belts are up to 99 percent effective at preventing total ejections. *Nabors Well Services, Ltd. v. Romero*, 456 S.W.3d 553, 565 (Tex. 2015), citing Nat'l Highway Traffic Safety Admin., Dep't of Transp., DOT HS 810 649, Primary Enforcement Saves Lives--The Case For Upgrading Secondary Safety Belt Laws 25 (Sept. 2006). That NHSTA paper offers no citation to support this proposition, but the numbers appear to match those in the Parenteau and Shah study, suggesting its acceptance by NHTSA.

The Gloeckner 2006 study collected NASS-CDS reports on rollover accidents from 1995 to 2004 for passenger vehicles, SUVs, pick-ups, and vans. They sub-divided the data into rollovers by the number of quarter turns; germane to this case was a category of 12 or more quarter turns (which would be 3 or more complete revolutions). Middle seat occupants and those twelve years of age or younger were excluded. The paper claims a 95 percent confidence interval for each data point. It looked at total of 8,971 rollover vehicle occupants in the 1995-2004 period. The study flagged any sub-category with less than ten samples. The study reports that the risk of complete ejection for unrestrained occupants in three revolution plus rollovers on the order of 80 percent, regardless of whether the occupant was on the near side or trailing side of the rollover. However, “[t]he risk of complete ejection for restrained occupants was very low (0.37% for near side occupants and 0.11% for far side occupants).” *Id.* at 165.

We conclude that the trial court erred in excluding this specific opinion (seat belts reduce the risk of ejections in serious rollovers). The opinion appears to be supported by several studies that adequately state their statistical methodology. The only specific challenges that Appellees raised below to the studies in general were that they did not involve a 1993 Suburban, they were not peer reviewed, and they did not include children under twelve years of age. Appellees offered no evidence that the seat belts or ejection potential of a 1993 Suburban is appreciably different than the vehicles included in these studies. The only sworn testimony before the trial court was that all the studies were peer reviewed. We accept that the studies might have limitations as they apply to Marielena, Edgar, and Saul, which we address below. Any other limitations on the studies with respect to this particular opinion would affect the weight of the inference to be drawn.

The second leg to Dr. Funk's opinion is that ejected occupants have a far higher incidence of serious injury and death compared to restrained non-ejected occupants. For this proposition, Dr. Funk relies on Malliaris & Digges 1987, Digges & Eigen 2007, Gloeckner 2006, Moore, 2005, and Parenteau and Shah. To a lesser extent he also relied three of his own published works, Funk 2008 Delta-V, Funk, 2007, and Funk 2008.

Malliaris and Digges analyzed the entire population of NASS crash data from 1979 to 1985, and the FARS database, which is limited to fatal accidents, from 1975 to 1985. Dr. Funk testified that the NASS database has approximately 5,000 inputted crashes each year. The study generally reports that lap and shoulder restraints are 58.2 percent to 51 percent effective in preventing AIS-3 or greater injuries. *Id.* at 243, Table 1. Avoiding ejection reduces one's risk of fatality by 70 to 80 percent regardless of vehicle type and occupant seating position, which we understand equates to a relative risk for ejection of at least seven. *Id.* at 251, Table 14. The authors contend that they accounted for confounding variables, such as inaccuracies in the reporting rate for usage of seat belts, and crash conditions between restrained and unrestrained occupants. *Id.* at 242-43, 251.

Digges & Eigen, 2003, looked at over 25,000 NASS-CDS crashes from 1995 to 2001 and generally discuss the effectiveness of restraints and importance of avoiding ejection. Within the table of results from the data it analyzes, however, we do not find the statistics for which Dr. Funk cites the study. The most we take away from this study is that among the seriously injured belted front seat occupants in rollover accidents, only 0.2 percent were totally ejected from the vehicle.

As noted above, the Gloeckner study collected 8,971 NASS-CDS reports on rollover accidents from 1995 to 2004 for passenger vehicles, SUVs, pick-ups, and vans. The study

reported that the risk of serious injury (AIS-3 or higher) to non-ejected occupants in a rollover of three or more revolutions was just more than ten percent. *Id.* at 161, Table 5.<sup>18</sup> Conversely, the AIS-3 or higher injury rate was near 70 percent for ejected occupants. *Id.* at 161, Table 4. The risk of serious injury (AIS-3 or higher) to restrained occupants in a rollover of three or more revolutions was also just more than ten percent. *Id.* The injury rate was just over 60 percent for unrestrained occupants. Though the AIS data allows for categorizing which part of the body is injured (i.e. head, thorax, etc.) this study does not attempt to report the injury risk by specific body part. It also does not divide out fatalities.

The Moore 2006 study looks at the incidence of injury by AIS body part for restrained and unrestrained occupants. For head injuries, for instance, the incidence of AIS-3 or higher injury for unrestrained occupants was about 23 percent, while only about 10 percent for restrained occupants in three revolution rollovers. *Id.* at 139, Figure 3a.<sup>19</sup> The findings were similar for injuries to the thorax. *Id.* at 140, Figure 3d. There was little difference in upper extremity injuries, but a sizeable difference in lower extremity injuries (almost 25 percent for unrestrained versus about 1 percent for restrained). *Id.* at 141, Figure 3(g)(h). In the aggregate, the risk of an AIS-3 or higher injury was 73.9 percent for an unrestrained occupant in a three revolution rollover event while 30.7 percent for a restrained occupant. *Id.* at 144, Figure 4. The authors referenced a 95 percent confidence interval. For any ejected occupant, the risk of a serious injury was near 70 percent. *Id.* at 145, Figure 7.

The Parenteau and Shah study also addressed risk of injury. It found a tenfold increase in the risk of serious injury when the driver was completely ejected verse being not ejected. The

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<sup>18</sup> The study reports its findings with bar graphs which only allow the reader to approximate the precise percentages.

<sup>19</sup> The data is reported in bar charts which again only allows for approximation of the exact percentages.

study aggregated all rollovers of one revolution and above into a single group. As noted above, this study looked at a total of 608 rollover accidents.

Finally, Dr. Funk referred to three of his own published papers in support of this proposition. One of those papers was his 2008 Delta V study which was actually a reinterpretation of prior studies which used the NASS-CDS data. That data contains a calculated estimate for the Delta-V for each of the crashes. In this study, Funk looked at 228 of those crashes from the NASS-CDS database where he had access to the vehicle data recorder. The data recorder would have information on the actual (as opposed to calculated) Delta-V. His study found the calculated or estimated Delta-V understates the actual Delta-V by an average of 19 percent. His study also looked at the statistical concepts of scatter and bias error, ultimately concluding they all offset one another, such that that previously developed risk curves for low Delta-Vs were “generally accurate.” This paper excluded rollovers, and Dr. Funk principally cited it for his contention that the Appellees would not have likely suffered any serious injury in the first phase of the accident (the sideswipe).

His 2007 paper developed a mathematical model for the trajectory of a person who is ejected, which he then experimentally tested by ejecting test dummies in staged rollover accidents. The 2008 paper further tests his model both against staged test dummy crashes and two actual rollovers that were fortuitously caught on film. Both these papers were published and peer reviewed.

Based on our review of these studies, and the objections that Appellees raised to them, we conclude that the trial court abused its discretion in excluding on *Robinson* grounds the general conclusions that ejections significantly increase the risk of serious injury and death, and the risk of serious injury differs between belted and unbelted persons in a rollover accident.

Appellees' challenge to these studies include the unproven claim that they were not peer reviewed. To the contrary, the only testimony at the hearing below was that each study was peer reviewed.<sup>20</sup> Appellees also contended that one or more of the papers were written for litigation purposes, but presented no proof of that claim. They challenged the studies based on rollovers being complex events which include many confounding factors. While that may be true, many of the studies segregated the rollovers into subcategories based on the number of quarter turns, and others account for secondary planar accidents occurring prior to the rollover. Others expressly discuss how they account for confounding factors.

Appellees specifically contended the Parenteau and Shah paper contained a flaw in the data set. The paper that they cite for the claim, Gloeckner, 2006, noted the error involved the ratio of near side to far side AIS3+ injuries which is not a proposition that Dr. Funk relied upon. *Id.* at 168. Even at that, the flaw relates to a different paper by Parenteau.<sup>21</sup> Appellees also note that the studies exclude children under the age of twelve which is a fair point, but which only affects the claims of Marielena, Edgar, and Saul. Otherwise, we conclude the trial court abused its discretion in its wholesale exclusion of Dr. Funk's opinions based on these studies.

That leads us then to Dr. Funk's specific opinions about the cause of each Appellees' injuries. His ultimate opinion, as expressed in his report, is that "[m]ost, if not, all of the serious injuries sustained by the occupants of the subject Suburban were the direct result of being ejected from the vehicle during the rollover portion of the crash." He focused on Marielena, Esperanza,

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<sup>20</sup> At the hearing, Appellees relied on a disclaimer on the SAE papers whereby the entity states that the "[p]ositions and opinions advanced in this paper are those of the author(s) and not necessarily those of SAE." On the very same page, however, this statement appears: "By mandate of the Engineering Meetings Board, this paper has been approved for SAE publication upon completion of a peer review process by a minimum of three (3) industry experts under the supervision of the session organizer."

<sup>21</sup> The Gloeckner paper references a criticism of Chantel Parenteau, Madana Gopal, and David Viano, *Near and far-side front passenger kinematics in a vehicle rollover*, Society of Automotive Engineers, 2001-01-0176, 2001 (Corrected). The paper that Dr. Funk relies on for this case is Chantel Parenteau and Minoos Shah, *Driver Injuries in US Single-Event Rollovers*, Society of Automotive Engineers, Paper 2000-01-0633 (2000).

Mino, and Aydee, concluding that had they been belted their risk of serious injury would be ten percent or less. We conclude that Dr. Funk has sufficiently tied the specific facts of some the Appellees' situation to the general causation principles that he established through the literature. For others, he failed to do so.

The studies allowed Dr. Funk to fairly conclude that ejected occupants incurred a significantly higher risk of death than those who remained in the vehicle. They further allowed him to conclude that wearing a seat belt substantially reduces the risk of ejection in a three revolution rollover. Nabors would have been able to offer some evidence, both through Dr. Funk and from the DPS office, that Aydee was unbelted. The evidence was uncontested that Aydee was ejected, and the photographs and a death certificate support the inference that she suffered a head trauma. Based on these foundations, Dr. Funk had a reliable basis to conclude that her failure to wear a seat belt, if proven, increased her risk of death sufficiently that a jury might conclude she would not otherwise have died.

Similarly, Dr. Funk tied his theory to at least some of the injuries sustained by Esperanza and Mino Soto. Mino sustained serious head trauma. The Moore 2006 study showed that the incidence of AIS-3 or higher head injury for unrestrained occupants was about 23 percent, while only about 10 percent for restrained occupants in three revolution rollovers. Esperanza sustained significant injuries to her torso. The Moore 2006 study showed a similar increase in the incidence of AIS-3 or higher torso injuries for unrestrained versus restrained occupants. In the same study, the aggregate risk of an AIS-3 or higher injury for an unrestrained occupant in a three revolution rollover event was 73.9 percent, while only 30.7 percent for a restrained occupant. Dr. Funk developed a specific basis to analogize Esperanza and Mino to these studies. Esperanza had predominately right side injuries suggesting an impact trauma to that side. The

medical records refer to road rash, and other testimony would support that she was ejected. Mino was found by the EMTs lying on the street and she had significant abrasion on her right arm and shoulder.

Conversely, we conclude that the trial court did not abuse its discretion in restricting Dr. Funk's specific injury causation opinions as to Marielena, Guadalupe, Edgar, and Saul. Marielena may well have been ejected and suffered severe head trauma leading to blindness, a broken foot, and a possible brain injury. Our concern is that Dr. Funk's report concluded that because the back of her seat had broken, he could not opine that an engaged seat belt would have worked in any event.<sup>22</sup> His sworn testimony similarly undermines the seat belt defense because of the failure of seat back.<sup>23</sup> The jury would be left to speculate whether wearing a seat belt in an aftermarket seat that broke, thus rendering the belt less effective, would have resulted in fewer injuries. Moreover, the studies upon which Dr. Funk relied upon excluded children of Marielena's age, and none is specific to this type of aftermarket seat. Reliable expert testimony must be based on a probability standard, rather than on mere possibility. *See Gen. Motors Corp. v. Iracheta*, 161 S.W.3d 462, 471-72 (Tex. 2005); *Burroughs Wellcome Co. v. Crye*, 907 S.W.2d

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<sup>22</sup> His report states: "Separation of the seatback from the seat bottom during the crash would have seriously compromised the ability of the center front lap belt to restrain Marielena Soto. Even if she had been wearing her lap belt, it would have been possible for her to slip out of the lap belt if her seatback did not maintain its integrity throughout the crash event."

<sup>23</sup> At deposition he was asked if she would have suffered the same injuries if she was belted. He replied, "Well, she would certainly be at risk for the same types of injuries. I mean, it's hard to say because she might get ejected at a slightly different point and that might be better or worse, but certainly there's the still the risk [sic] of ejection, which carries a high risk of serious injury." At the *Robinson* hearing, he was asked if she was snugly belted in, would the seat belt have done the job it should do. He replied: "It would not have provided-- it might have helped a little bit; but certainly, if it's not snug, its protective capability is diminished. And there's the additional problem of the seat back coming off during the rollover. Those two things together, I think, would make it very probable or certainly possible that she wouldn't be protected. You really need a snug seat belt and upright seat back." He also testified at the *Robinson* hearing: "And I also determined that, if she had been properly restrained *and in a seat that saved the others* [she would not get to an opening or strike her head on anything inside the vehicle]. And so it would be unlikely that she would get that same type of injury, if she had been belted." [Emphasis added.]



497, 500 (Tex. 1995). There are simply too many gaps in his analysis with regards to Marielena and we agree the trial court properly excluded his opinion as to her.

Dr. Funk's opinion also fails with regard to Guadalupe. The studies he cited primarily looked to serious AIS-3 or higher injuries. Since it is not clear from the record that Guadalupe's injury to her finger fits into that category, he cannot show as a matter of general causation that a finger injury is more or less likely in an ejection in a roll-over.

The principal injury for both Edgar and Saul were broken clavicles. Dr. Funk was unable to say that these injuries were unique to an ejection, as distinct to something they could have sustained as being belted passengers banging up against the side of the vehicle as it rolled over. Even the studies that he relied on excluded passenger injuries for person under twelve years old, thus he could not tie the specifics of their situation to the studies in general. The trial court properly excluded Dr. Funk's injury causation opinions as to Guadalupe, Edgar, and Saul.

#### **Opinions On The Scenarios For Ejection**

The trial court excluded Dr. Funk's testimony about eight different trajectories that Aydee may have followed upon being ejected in the accident. There was no dispute that she was ejected, and because she died at the scene, her final resting position was documented by the DPS, as was the tripping point and final position of the Suburban. Dr. Funk applied basic tenets of physics to calculate Aydee's possible trajectories. At the *Robinson* hearing, he provided the calculations in chart form to explain the scenarios. The analysis included a range for her velocity at impact (30 to 47 mph). We discern no specific challenge to this opinion, other than perhaps the opinion is based on Dr. Funk's own published works.

This opinion fits nicely in the *Robinson* factor framework. Dr. Funk developed a mathematical hypothesis for ejection trajectories that he was able to test, both against

experimental crash dummy testing, and real world video footage of actual ejections. Funk, 2007; Funk 2008. The studies meet at least three of the *Robinson* factors--a testable hypothesis, a disclosed margin of error, and peer review of the theory. Because it is a mathematical model, it also lacks subjectivity. We conclude it was error to have excluded this opinion on a *Robinson* based challenge.

### **WAS THE ERROR HARMFUL?**

Nabors carries the burden to show that the erroneous exclusion of the evidence probably caused the rendition of an improper judgment. TEX.R.APP.P. 44.1(a)(1). As part of that inquiry, we must review the entire record, “considering the state of the evidence, the strength and weakness of the case, and the verdict.” *Reliance Steel & Aluminum Co. v. Sevcik*, 267 S.W.3d 867, 871 (Tex. 2008)(internal quotation marks and citation omitted). Nabors must show the excluded evidence was “crucial to a key issue” and if so, the error was likely harmful. *Id.* at 873. “By contrast, admission or exclusion is likely harmless if the evidence was cumulative, or if the rest of the evidence was so one-sided that the error likely made no difference.” *Id.*

Given that we have sustained part of the trial court’s ruling on Dr. Funk, we also turn to the *a priori* question of whether expert testimony was needed in this case to support Nabors’ seat belt defense. The Texas Supreme Court foreshadowed this question noting, “[e]xpert testimony will often be required to establish relevance, but we decline to say it will be required in all cases.” *Romero*, 456 S.W.3d at 563.

Generally, “[e]xpert testimony is required when an issue involves matters beyond jurors’ common understanding.” *Mack Trucks, Inc. v. Tamez*, 206 S.W.3d 572, 583 (Tex. 2006) (citations omitted). That common understanding must be sufficient to allow a jury to make a finding with reasonable probability. *Id.* In the context of product defects, for instance, the

Supreme Court has often required expert testimony to support a jury finding that a product defect caused the plaintiff harm. *Gharda USA, Inc.*, 464 S.W.3d at 348 (whether drum of chemical was contaminated and thus caused a fire); *BIC Pen Corp. v. Carter*, 346 S.W.3d 533, 542 (Tex. 2011)(whether child resistant lighter would have prevented accident); *Tamez*, 206 S.W.3d at 582-83 (whether defective fuel system caused the release of diesel fuel and then ignited); *Nissan Motor Co. v. Armstrong*, 145 S.W.3d 131, 137-38 (Tex. 2004)(whether product defect caused a motor vehicle to accelerate unintentionally). Expert testimony may also be needed to establish the extent to which medical expenses and treatments are causally related to an accident. *Guevara v. Ferrer*, 247 S.W.3d 662, 669-70 (Tex. 2007). But experts are not always required. In *JLG Trucking, LLC v. Garza*, 466 S.W.3d 157, 164-65 (Tex. 2015) the court held that expert testimony was not required to guide a jury in deciding if evidence of injuries from one auto accident contributed to the injuries being claimed by the plaintiff in another accident.

Applying Texas law, the Fifth Circuit held in *Goodner v. Hyundai Motor Co., Ltd.*, 650 F.3d 1034, 1044 (5th Cir. 2011) that expert testimony was not necessary to show that a malfunctioning seat belt caused a passenger's death. The passenger's seat in that case reclined to such an extent that the seat belt was ineffective in preventing her ejection in a rollover accident. The passenger there, like Aydee, died from the ejection injuries, and her family sued the car manufacturer alleging a defect in the seat reclining mechanism. The Fifth Circuit affirmed the verdict in favor of the passenger and rejected the argument that expert testimony was necessary to support the ultimate question of whether the defective seat caused the death. The jury could have first considered that the belted driver in that case, who stayed in the car, suffered only minor injuries. The jury also had before it some expert testimony on the more technical issues in

the case, such as the physics of the accident and that ejections in general greatly increase the risk of injury. *Id.* at 1045.

We conclude that some of the injury claims at issue here would require expert testimony while others would not. A jury using its own common experience and knowledge would understand that road rash injuries are sustained from scraping along the pavement once a person is ejected from the vehicle. They would similarly understand those injuries are likely avoided if a person is belted and secured inside a vehicle. And as in *Goodner*, a jury would also understand that an ejection injury such as Aydee sustained increased her risk of death, particularly when the more technical aspects of Aydee's situation are explained by expert testimony. Here, the expert should have been allowed to testify to the physics of the accident, the possible ejection trajectories, and the speed at impact that Aydee likely experienced. Being belted in the Suburban in a three-revolution rollover did not free Aydee from the risk of death, but it certainly diminished that risk. A jury might well have believed that had she been belted, she would have avoided the ensuing ejection and death.

Other injuries, however, are less intuitive. Edgar Romero and Saul Romero sustained broken clavicles, likely on the side of their body which was next to the vehicle's side walls. They might have sustained those injuries either from striking the vehicle, or assuming they were ejected, from striking the ground. Whether the risk of one was greater than the other is likely not in a juror's common knowledge or experience. With these overviews in mind, we address the claims of each of the Appellees.

*Martin Soto*

Martin obtained a judgment in his favor for his own injuries. Nabors does not claim that he was unbelted; rather its expert contended that because he was belted, he was relatively

uninjured. Nabors' seat belt defense would not apply to him. Martin's counsel asked the jury to award him sums as a bystander witness to the other's injuries, which might implicate their seat belt use in his recovery. But the total amount awarded him--\$5,000--is sufficiently modest that we are unable to conclude that the exclusion of the evidence likely affected his individual claim. Accordingly, we affirm the judgment in his favor.

*Esperanza Soto*

The medical records substantiate that Esperanza sustained injuries to her right side, including her pelvis and hip, rib cage, and shoulder. The medical records describe "road rash" abrasions to her right side. If for no other reason than the road rash injuries, a jury could conclude that she sustained ejection injuries which might have been avoided had she been properly belted.

The exclusion of the evidence as to Esperanza would be harmful in another regard. Nabors alleged that she was negligent for failing to wear a seat belt. If a jury believed that defense, and assigned her some share of the responsibility, that may have diminished Nabors' share to 50 percent or less, which in turn would affect its potential joint and several liability. Under the present judgment and the law governing it, Nabors was jointly and severally liable because it was found 51 percent at fault. Act of June 11, 2003, 78th Leg., R.S., ch. 204, § 4.07, 2003 TEX.GEN.LAWS 847, 858 (amended 2007)(current version at TEX.CIV.PRAC.&REM.CODE ANN. § 33.013(b)(West 2015). We conclude the exclusion of the seat belt defense evidence and Dr. Funk's testimony was harmful, and reverse the judgment as to Esperanza and remand her claim for a new trial.

*“Mino” Soto*

Mino suffered a closed head injury resulting in a left subdural hematoma. She also had abrasions on both of her arms and face which a treating doctor agreed were consistent with road rash, which in turn is consistent with an ejection injury. She herself testified to having a road rash scar. For much the same reason as her mother, Esperanza, we conclude the exclusion of the seat belt evidence likely affected the verdict in her favor and accordingly reverse and remand for her claim for a new trial.

*Guadalupe Soto*

Guadalupe presents another unusual situation. She suffered only some scrapes and avulsion injury to one finger, requiring the removal of a fingernail. This injury might not even be classified as serious (AIS-3) under the various studies relied on by Dr. Funk. Nor did Nabors tie her case specifically into what those studies attempt to demonstrate. The situation is complicated, however, by Appellees’ claim that she was also entitled to bystander recoveries. In final argument, the jury was asked to award her mental anguish damages for witnessing the more serious injuries of her twin sister Mino. She was awarded a substantial sum for physical pain and mental anguish.<sup>24</sup> But for that fact, we would be inclined to affirm her award, but because her award might well include bystander recoveries for the injuries of others that must be reversed, we also reverse the judgment as to Guadalupe as well.

*Marielena Soto*

We have sustained the exclusion of Dr. Funk’s testimony as to Marielena because her seat back broke in the accident, impairing the function of her seat belt. Because the functioning of this broken aftermarket seat is a matter beyond the common experience of a jury, expert

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<sup>24</sup> The jury awarded \$10,000 in past physical pain and mental anguish and \$25,000 in future physical pain and mental anguish.

testimony was necessary to establish its seat belt would have secured Marielena from being ejected. While Nabors implies that Martin was negligent in selecting or installing the aftermarket chair, there is no evidence in the record supporting such a claim. No one testified that the seat was improperly installed, or that the seat was not intended for this application.<sup>25</sup> We accordingly overrule Nabors issues with respect Marielena and affirm the judgment in her favor.

*Edgar and Saul Romero*

Edgar and Saul were awarded damages for their physical pain and mental anguish (past and future) from the accident. In a separate question, the jury awarded additional sums for their wrongful death damages sustained from the loss of their mother, Aydee. We conclude that that the portion of the judgment attributable to their personal injury claims should stand, but the award from the death of Aydee must be reversed.

We have sustained the portion of the challenge to Dr. Funk's opinion as to Edgar and Saul's own injuries. Expert testimony would have been necessary to demonstrate that the risk of a clavicle fracture from ejection was appreciably higher than a clavicle fracture from impact with the interior of the vehicle. Even Dr. Funk was unable to say that these injuries were unique to an ejection. Accordingly, the portion of the judgment attributable to their own personal injury claim will stand.

As wrongful death beneficiaries, their recovery is subject to the same claims and defenses that would apply to Aydee had she lived. *Russell v. Ingersoll-Rand Co.*, 841 S.W.2d 343, 345 (Tex. 1992). Nabors sufficiently alleged that Aydee herself was negligent in not buckling up. Aydee, who was an adult and sitting in the back, was not legally required to wear a seat belt, nor

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<sup>25</sup> Dr. Funk testified that seat had no "indication" that it was certified as being in compliance with a particular federal motor vehicle standard. That is not the same thing as proving that it was not in compliance, or that Martin Soto would have been negligent for installing the seat.

would Martin be required to ensure that she did. Act of June 14, 2001, 77th Leg., R.S., ch. 910, § 2, 2001 TEX.GEN.LAWS 1821, 1821-22 (amended 2005, 2007, 2009, 2013)(requiring driver to ensure all front seat passengers and all children to be secured). But the Texas Supreme Court’s decision in this case allows a jury to decide if a reasonable person should have buckled up even if the Transportation Code does not mandate it. 456 S.W.3d at 563-64 (“And in cases in which an unrestrained plaintiff was not personally in violation of a seat-belt law, the fact-finder may consider whether the plaintiff was negligent under the applicable standard of reasonable care.”). As her conduct would necessarily affect the recovery of the wrongful death beneficiaries, the exclusion of evidence which would have allowed Nabors to argue her contributory negligence was harmful. We accordingly reverse that portion of the judgment awarding wrongful death damages to Edgar and Saul and remand that claim for a new trial. The same is true for the award to Aydee’s estate for her funeral expenses. The judgment in favor of her estate must be reversed and remanded for new trial as well.

### **CONCLUSION**

In summary, we affirm the portion of the judgment resolving the claims of Martin Soto, Marielena Soto, and the personal injury claims of Edgar Romero and Saul Romero. We reverse and remand for new trial the claims of Esperanza Soto, “Mino” Soto, Guadalupe Soto, and the wrongful death claims of the Estate of Aydee Romero, and her wrongful death beneficiaries, Edgar and Saul Romero.

February 29, 2016

ANN CRAWFORD McCLURE, Chief Justice

Before McClure, C.J., Rodriguez, and Hughes, JJ.