United States Court of Appeals
FOR THE EIGHTH CIRCUIT

No. 01-3181

Kimberly R. Smith, *
*
Plaintiff-Appellant, *
*
v. *
*
BMW North America, Inc.; BMW AG; *
Roadshow Enterprises, Inc., doing *
business as Roadshow BMW Inc., *
*
Defendants-Appellees. *

No. 02-1016

Kimberly R. Smith, *
*
Plaintiff-Appellant, *
*
v. *
*
BMW North America, Inc.; BMW AG; *
Roadshow Enterprises, doing business *
as Roadshow BMW Inc., *
*
Defendants-Appellees. *

Appeals from the United States
District Court for the
Eastern District of Arkansas.

Submitted: June 28, 2002
Filed: October 24, 2002

Before HANSEN, Chief Judge, BRIGHT, and MURPHY, Circuit Judges.

BRIGHT, Circuit Judge.

On August 24, 1997, appellant Kimberly R. Smith suffered severe injuries in an automobile accident rendering her a quadriplegic while driving her 1994 BMW automobile. She brought a product liability action against appellees BMW North America, Inc., BMW AG, and Roadshow Enterprises, Inc., d/b/a Roadshow BMW, Inc. (collectively BMW). Smith alleged that the air bag in her car was faulty and, had the air bag properly deployed, it would have reduced or prevented her injuries. BMW moved to exclude the testimony of two of Smith's experts and for summary judgment. The district court held a Daubert hearing and excluded the proposed testimony of Smith's expert witnesses under Fed. R. Evid. 702 and Daubert v. Merrell Dow Pharms., 509 U.S. 579 (1993). Having determined that without the testimony of her experts Smith could not establish a prima facie case against BMW, the district court also granted BMW's motion for summary judgment. The district court denied Smith's subsequent motion under Fed. R. Civ. P. 60(b) for relief from the judgment. Smith appealed to this court the order granting summary judgment and separately appealed the order denying her Rule 60(b) motion. We consolidated the appeals. We now vacate the district court's grant of summary judgment and remand for proceedings consistent with this opinion.

I. BACKGROUND

Appellant Kimberly Smith suffered severe injuries in a car accident while driving her 1994 BMW 318i. She lost control of the vehicle which then left the road, struck an embankment, and rolled several times. Her injuries resulted in quadriplegia. She brought a product liability lawsuit against BMW, alleging that the air bag in her car was faulty and that, had her air bag deployed, it would have reduced or prevented her injuries.

Smith intended to offer at trial the testimony of Dr. Larry Williams, a certified accident reconstructionist, and Dr. Stephen Erickson, a forensic pathologist. Dr. Williams was to testify regarding his calculations of the barrier equivalent velocity[1] of Smith's vehicle when it struck the embankment. Dr. Williams' testimony would have established that the barrier equivalent velocity was great enough that a properly functioning air bag would have deployed upon impact.[2] Dr. Erickson was to testify regarding his opinion that Smith's injuries would have been prevented or reduced had the air bag properly deployed.

BMW moved for the exclusion of Dr. Erickson's testimony and for summary judgment. The district court set a Daubert hearing for June 12, 2001. One week before the hearing, BMW moved to exclude the proposed testimony of Dr. Williams

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[1]A vehicle's barrier equivalent velocity in a crash is the velocity with which the car would have to impact an infinitely rigid barrier at the same angle of impact in order to sustain the same damage as actually occurred. The barrier equivalent velocity "combine[s] into one speed-like measure the energies, forces, and motions that a vehicle experiences during a crash." Crespo v. Chrysler Corp., 75 F. Supp. 2d 225, 227 n.4 (S.D.N.Y. 1999).

[2]The parties disagree as to the threshold barrier equivalent velocity for air bag deployment. The record contains numbers ranging from 12 to 15.5 miles-per-hour.

as well. BMW informed the district court that it would be calling Mr. John Bentley, an accident reconstruction expert, to testify at the Daubert hearing in opposition of Dr. Williams.

At the Daubert hearing, Dr. Williams testified regarding his calculations of the principal direction of force[3] and measurements of vehicle deformation, or crush, which he entered into the EDCrash computer program to calculate the barrier equivalent velocity of Smith's vehicle when it struck the embankment.[4] Dr. Williams concluded that the barrier equivalent velocity was 22 to 26 miles-per-hour.

Regarding the principal direction of force, Dr. Williams testified that he visited the scene of the accident with the state trooper who viewed the accident scene in the immediate aftermath of the crash. He also visited the auto salvage yard with that trooper. This permitted Dr. Williams "to incorporate [the trooper's] firsthand observations with my work." He stated that the trooper's statements "about the evidence of the debris and path of travel of the vehicle" helped him significantly. The trooper's statements that the vehicle climbed the embankment led Dr. Williams to conclude that "the vehicle ha[d] to be going into the mountain." Dr. Williams also

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[3]A vehicle's principal direction of force during impact is the direction of the force that causes the deformation and structural displacement in the damaged vehicle. The principal direction of force is measured in degrees from a head-on impact along the car's longitudinal axis. A 0° principal direction of force corresponds to a twelve o'clock or head-on impact. A 30° principal direction of force corresponds to an impact at one o'clock and a –30° principal direction of force corresponds to an impact at eleven o'clock.

[4]The EDCrash computer program takes as input the principal direction of force, measurements of displacement in the car's structure (deformation or crush), and known data regarding the car's structure and materials from which it is manufactured. The program then outputs the barrier equivalent velocity for a given vehicle accident. Both Dr. Williams and Mr. Bentley used the EDCrash computer program and its relevance and reliability is unchallenged.

consulted the tow-truck driver who removed the damaged vehicle, read deposition testimony and the police report of the accident, and viewed various photographs of the vehicle. Based upon the entirety of this evidence, Dr. Williams concluded that the principal direction of force was "no more than 20 degrees into the front of the vehicle." He used –20° as the principal direction of force input into the EDCrash computer program.[5] When asked to explain how such an impact could account for the existence of passenger-to-driver side direction of crash damage and displacement of the front end of the vehicle, Dr. Williams opined that the car sustained that damage when it rotated counterclockwise at impact.

As to his deformation measurements, Dr. Williams testified that he began with a scale drawing of the vehicle around which he superimposed a rectangle fitted to the dimensions of the undamaged car. He used the rectangle to represent the vehicle in its undamaged state. From six different points along the edge of the rectangle corresponding to the front of the vehicle, he measured the perpendicular displacement from the rectangle to the damaged vehicle. It is from these displacement measurements, the principal direction of force, and data pertaining to the vehicle's structure, that the EDCrash computer program calculates the barrier equivalent velocity.

BMW then offered the expert testimony of Mr. Bentley. Bentley testified that Dr. Williams incorrectly measured the displacement of the car's front end caused by the accident. Mr. Bentley also testified that Dr. Williams' estimate of the principal direction of force could not generate the counterclockwise rotation he said accounted for the passenger-to-driver side displacement of the front end. According to Bentley, these mistakes in the data entered into the EDCrash computer program led to an incorrect calculation of the barrier equivalent velocity.

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[5]The negative sign reflects that the driver's side of the front of the car struck the embankment first. See note 3, supra.

Mr. Bentley stated that Dr. Williams' use of a rectangle to represent the vehicle in its undamaged state led to incorrect displacement measurements. Mr. Bentley testified that using a rectangular representation of the vehicle overmeasures displacement because such measurements from the rectangle to the deformed vehicle include air gaps, particularly at the corners of the vehicle. He stated that Dr. Williams, rather than employ a rectangular model, should have used an exemplar representation of the vehicle (i.e., one that uses the actual parameters of the vehicle in an undamaged state). Mr. Bentley asserted that use of an exemplar representation of the vehicle is necessary under a protocol for displacement measurement as set out by the Tumbas papers.[6]

Dr. Williams testified that he had been trained to use a rectangular representation of the vehicle in order to account for the restitution, the amount the vehicle rebounds from the maximum engagement of the crush. Restitution occurs nearly instantaneously in an accident; it is immeasurable from an examination of the post-accident vehicle. According to Dr. Williams, post-accident measurements will underestimate the actual deformation the vehicle sustained at its maximum engagement because they do not include restitution. Dr. Williams commented that measurement of restitution is "one of the real controversies currently in the literature."

Smith also attempted to introduce the testimony of Dr. Erickson, a forensic pathologist, to address the causation element of her claim. Dr. Erickson based his opinions on his observations of the accident scene, discussions with the investigating trooper and treating neurosurgeon, his review of their depositions, his examination of Smith's vehicle, his interview with a witness to the crash scene, his review of

[6]Nicholas S. Tumbas & Russel A. Smith, *Measuring Protocol for Quantifying Vehicle Damage from an Energy Basis Point of View*, SAE Paper No. 880072 (1988).

Smith's medical records, the opinions of Dr. Williams, and his experience as a forensic pathologist.

Dr. Erickson assumed that Smith was injured either when the car struck the embankment or during the subsequent rollover.[7] He determined that, to a reasonable degree of medical certainty, Smith's neck was broken at the initial impact of her vehicle with the embankment, rather than in the rollover. He based this opinion on the following factors: (1) according to her neurosurgeon, Smith's neck injury was a wedge fracture, more likely produced by neck flexion as the car quickly decelerated than by a rollover in which a compression or burst fracture would be more typical; (2) there was no medical evidence of trauma to Smith's head; (3) Smith was wearing her seat belt at the time of the accident.

Dr. Erickson further opined that, to a reasonable degree of medical certainty, the air bag would have prevented Smith's neck flexion and prevented or reduced her neck injuries had it deployed. Dr. Erickson reached this conclusion based upon his understanding of how air bags operate, which he gained from personal observations and films, from attending a national conference for forensic pathologists on air bag operation, and from reading articles on what air bags are designed to do.

By order dated July 5, 2001, and pursuant to Fed. R. Evid. 702 and Daubert v. Merrell Dow Pharms., 509 U.S. 579 (1993), the district court excluded the testimony of both Dr. Williams and Dr. Erickson, having determined that their opinions were unreliable and would not be helpful to the jury. The district court then granted summary judgment in favor of BMW because, without the testimony of her experts, Smith could not succeed on her products liability claim.

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[7]The vehicle's air bag is not intended to deploy during a rollover. Injuries sustained during a rollover cannot be attributed to the failure of the air bag to deploy.

Smith moved the district court to vacate this final judgment pursuant to Fed. R. Civ. P. 60(b)(3) or 60(b)(6).[8] Smith argued that in granting summary judgment to BMW, the district court relied on Mr. Bentley's false and misleading testimony. The district court denied the 60(b) motions in an order issued on December 5, 2001. Smith now appeals both the summary judgment order and the order denying her 60(b) motion. We determine that the district court's grant of summary judgment of dismissal to BMW be vacated and we remand for further proceedings. We dismiss Smith's appeal on the 60(b) issue.

II. DISCUSSION

Smith argues that the district court erred in excluding the testimony of her experts, Drs. Williams and Erickson.

Federal Rule of Evidence 702 governs admissibility of expert testimony. Rule 702 explains:

> If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise, if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case.

Fed. R. Evid. 702 (2001).

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[8] "On motion and upon such terms as are just, the court may relieve a party . . . from a final judgment, order, or proceeding for the following reasons: . . .(3) fraud, . . . misrepresentation, or other misconduct of an adverse party, . . . (6) any other reason justifying relief from the operation of the judgment." Fed. R. Civ. P. 60(b).

We review the exclusion of expert testimony for abuse of discretion. General Elec. Co. v. Joiner, 522 U.S. 136, 143 (1997). We review de novo the district court's grant of summary judgment. Netland v. Hess & Clark, Inc., 284 F.3d 895, 898 (8th Cir. 2002). Summary judgment is appropriate if, after viewing the facts and all reasonable inferences in the light most favorable to the nonmoving party, the record demonstrates that there is no genuine issue as to any material fact and that the moving party is entitled to judgment as a matter of law. Id.; see also Fed. R. Civ. P. 56(c); Celotex Corp. v. Catrett, 477 U.S. 317, 322-23 (1986).

Under Weisgram v. Marley Co., 528 U.S. 440 (2000), an appellate court may direct entry of judgment as a matter of law when it determines evidence was erroneously admitted at trial and that the remaining, properly admitted, evidence is insufficient to constitute a submissible case. In a like manner, an appellate court may vacate a summary judgment on the ground that evidence that should have been admitted or is shown to be available creates a genuine issue of material fact requiring further proceedings.

A. Exclusion of Dr. Erickson's Proposed Testimony

Dr. Erickson testified that, to a reasonable degree of medical certainty, Smith's neck was broken at the initial impact of her vehicle with the embankment, rather than in the rollover. He also testified that to a reasonable degree of medical certainty the air bag would have prevented or reduced her neck injuries, had it deployed.

The district court concluded that Dr. Erickson's opinions about the cause of Smith's neck injuries were not scientifically or medically reliable and therefore could not assist a jury. The district court offered seven reasons for concluding that Dr. Erickson's testimony was not scientifically or medically reliable: (1) his experience as a forensic pathologist was inapplicable to determining whether Smith sustained a broken neck due to pure acceleration-deceleration forces because, as a forensic

pathologist, he has never seen or read about a car accident where a person's neck was broken in this manner; (2) he did not know and could not estimate how much force occurred on the initial impact of the accident or how much force would have been required to break Smith's neck; (3) he relied on medical knowledge as opposed to scientific knowledge; (4) he did not perform a biomechanical evaluation using engineering or physics; (5) he could not use engineering principles to calculate possible accelerations upward in Smith's accident; (6) he based his opinion, in part, on Dr. Williams' opinion as to the barrier equivalent velocity of Smith's car at impact; and (7) his "logically flawed" conclusion that the acceleration-deceleration forces (i.e., the ones that occurred at impact with the embankment) acting on Smith's neck were more likely to have caused Smith's injuries than the forces incurred during the rollover portion of the accident because Smith had no head wounds, there was no indication in the car that she hit her head on the roof, and she was wearing her seat belt.

The first five reasons[9] offered by the district court all stem from what appears to be the court's ultimate reason for excluding Dr. Erickson's testimony: he is not an expert in biomechanics, physics, or engineering. The district court excluded Dr. Erickson's testimony because he did not know how much force Smith's neck could withstand, nor could he quantify the forces on Smith's body during the accident. However, Dr. Erickson was not called to offer expert testimony on those issues. Dr. Erickson offered his opinion that Smith was injured when her vehicle struck the embankment rather than during the rollover. He based this opinion on information that fell within his field: the injuries Smith sustained (e.g., wedge fracture in neck) and the injuries Smith did not sustain (e.g., no trauma to her head). He applied his

[9]The sixth reason relies on the district court's exclusion of Dr. Williams' testimony, discussed in the text, infra. The seventh reason attacks Dr. Erickson's conclusion, and not the methodology used in reaching the conclusion. Under Daubert, a court should review only the methodology of the expert, not his or her conclusion. 509 U.S. at 594-95.

medical knowledge and his experience to the physical evidence and came to a conclusion as to the cause of Smith's neck injury. The fact that experts in other fields might also be able to form opinions regarding the cause of Smith's neck injury and would base those opinions on factors other than those used by Dr. Erickson does not disqualify Dr. Erickson from offering testimony that would be helpful to the jury. See Smith v. Ford Motor Co., 215 F.3d 713, 720 (7th Cir. 2000) (stating that an expert's testimony need not relate directly to the ultimate issue that is to be resolved by the trier of fact, it only need be relevant to evaluating a factual matter); Clark by & Through Clark v. Heidrick, 150 F.3d 912, 915 (8th Cir. 1998) (stating that experts who can offer a global understanding of the possible causes of an injury are useful to a jury). The district court abused its discretion in excluding Dr. Erickson's testimony about when and how Smith suffered her neck injury.

The district court also abused its discretion in excluding Dr. Erickson's proposed testimony about whether a properly deployed air bag would have reduced or prevented Smith's injuries. Dr. Erickson based his opinion on his knowledge of the basic operation of air bags and his knowledge of how injuries of the type sustained by Smith occur and can be prevented. That is a sufficient basis for him to render an opinion on whether a properly deployed air bag would have reduced or prevented Smith's injuries. That Dr. Erickson was unable to quantify how much of Smith's assumed forward neck flexion occurred before a properly functioning air bag would have deployed, or by how much Smith's forward neck flexion would have been reduced by an air bag, is not grounds to exclude his opinion, based upon factors within his expertise, that to a reasonable degree of medical certainty a properly deploying air bag would have reduced Smith's injuries.

B. Exclusion of Dr. Williams' Proposed Testimony

The district court determined that "the method used by Dr. Williams to put information into the EDCrash program was fundamentally flawed. His opinions

based upon those EDCrash results are, therefore, inherently unreliable." In particular, the court found fault with Dr. Williams' estimates of principal direction of force and his displacement measurements. The court excluded Dr. Williams' proposed testimony in its entirety.

Principal Direction of Force

The district court concluded that Dr. Williams' estimate of the principal direction of force ("no more than twenty degrees into the hill") was "contradicted by the visible damage on the car and the principles of physics." The court determined that a -20° principal direction of force would not cause the passenger-to-driver side displacement observed in photographs of the car. The court was "dubious" of Dr. Williams' explanation that counterclockwise rotation of the car as it struck and climbed the embankment caused the passenger-to-driver side displacement observable in photographs of the car. Dr. Williams "attempted to demonstrate his theory using a tablet and his hand, but this courtroom demonstration did not appear to [the court] to support his theory." The court credited instead Mr. Bentley's testimony that there could be no significant counterclockwise rotation with a principal direction of force of -20°,[10] and concluded that "it appears to me to be a matter of simple physics (not beyond the ken of knowledge of the ordinary lay person)."

Dr. Williams based his estimate of the principal direction of force on all information he could obtain, including interviews with persons at the scene of the accident, his own inspection of the scene, and his own physical inspection of the vehicle. Dr. Williams testified that the principal direction of force was "no more than" -20° from being a head-on collision. From this range, Williams used the

[10]The district court overstated Mr. Bentley's testimony by taking him to say that a principal direction of force of -20° would result in a clockwise rotation. Mr. Bentley's testimony actually supports the possibility of a small counterclockwise rotation.

principal direction of force resulting in the lowest barrier equivalent velocity. All other things remaining constant, the closer the principal direction of force is to 0°, the stronger the counterclockwise rotation created by a driver's-side frontal impact, the greater the barrier equivalent velocity, and the better Smith's case.

Neither Mr. Bentley's testimony nor the district court's perception of Dr. Williams' hastily composed demonstration provides a valid basis for concluding that Dr. Williams' testimony about the principal direction of force is unreliable. Therefore, the district court cannot base its exclusion of Dr. Williams' expert opinion regarding the barrier equivalent velocity of Smith's vehicle on his determination of the principal direction of force.

Measurement of Frontal Displacement

The district court concluded that Dr. Williams' method for measuring the frontal displacement of Smith's car was flawed in that he failed to account for the inclusion of "free space" or "air gaps" in his frontal displacement measurements. Citing the Tumbas paper, the district court determined that air gaps should not be included in the displacement measurements entered into the EDCrash computer program. The court stated that it understood the rectangular method to be acceptable, so long as the resulting air gaps are taken into account and subtracted from the displacement measurements. With this understanding, the court determined that Dr. Williams had "*attempted* to use the rectangular method" but "[a]t no point did he account for free space."

We agree with the district court that Dr. Williams' statements that the air gaps account for restitution are unsupported by any evidence in the record. Smith offered no evidence that remotely explains how air gaps measured between the curve on an undamaged vehicle and the front of the approximating rectangle might compensate for the omission of a restitution measurement. In addition, the district court

determined that Dr. Williams' measurement of a twenty-five-inch displacement at the passenger corner of the front of the car was "clearly flawed" in that Dr. Williams measured from the baseline of his rectangular grid to a point on the side of the car. Again, we agree.

We conclude that Dr. Williams' measurement of frontal displacement was sufficiently flawed to serve as a basis for the district court's exclusion of Dr. Williams' testimony regarding the magnitude of the barrier equivalent velocity.[11]

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[11]That is not to say we agree with each and every reason the district court offered for excluding Dr. Williams' testimony. For example, the district court found it significant that Dr. Williams' method of measuring frontal displacement from a rectangular form rather than from the dimensions of an exemplar (dimensions of an undeformed vehicle) leads to a barrier equivalent velocity of approximately ten miles-per-hour for a car that has been in no accident and has no damage. Note, however, that if we consider a car in an accident at a low speed of, say, five miles-per-hour, so that upon impact its bumper flexes and then rebounds to its pre-collision form, the exemplar method of measuring frontal displacement would suggest there had been no collision at all.

The court also noted that Smith did not recall Dr. Williams to rebut Mr. Bentley's testimony or to explain why his (Dr. Williams') opinions were reliable despite Mr. Bentley's "damning" testimony. This assumes that Smith considered Mr. Bentley's testimony damning. Smith's decision to not re-examine Dr. Williams regarding his disagreements with Mr. Bentley's testimony does not provide ground for the district court to exclude Dr. Williams' testimony. Experts frequently disagree and their opinions, if reliable, are for a jury's consideration. See Bonner v. ISP Tech., Inc., 259 F.3d 924, 929-30 (8th Cir. 2001) ("As a general rule, the factual basis of an expert opinion goes to the credibility of the testimony, not the admissibility, and it is up to the opposing party to examine the factual basis for the opinion in cross-examination. Only if the expert's opinion is so fundamentally unsupported that it can offer no assistance to the jury must such testimony be excluded.").

C. Summary Judgment

Dr. Williams' displacement measurements contain errors as explained. Therefore, the barrier equivalent velocity he obtained from EDCrash is inadmissible. However, the district court erred in granting summary judgment.

Mr. Blaisdell, BMW's accident reconstructionist, corrected Dr. Williams' displacement measurements to account for air gaps.[12] Mr. Blaisdell entered the corrected measurements, along with Williams' principal direction of force estimate, into EDCrash. The resulting barrier equivalent velocity of 14.4 miles-per-hour lies within the 12 to 15.5 miles-per-hour range of barrier equivalent velocity values at which there is an issue of material fact as to whether the air bags should deploy.[13] BMW presented Mr. Blaisdell's results in its Reply to Plaintiff's Opposition to Summary Judgment; these results were before the district court when it granted summary judgment.

This evidence, along with Dr. Williams' admissible testimony regarding the principal direction of force and Dr. Erickson's testimony regarding causation, makes summary judgment for BMW inappropriate in this case. We therefore vacate the district court's grant of summary judgment to BMW. See City of Tuscaloosa v. Harcros Chem., Inc., 158 F.3d 548, 566-67, 572 (11th Cir. 1998) (reversing grant of summary judgment based in part on determination that a portion of expert's testimony, all of which had been excluded by district court, was admissible and that the admitted testimony created a genuine issue of material fact).

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[12]Mr. Blaisdell also corrected what he perceived to be another error: a slight alignment error between the axes of the vehicle profile and the "undamaged vehicle" rectangle.

[13]See note 2, supra.

We remand to the district court for such further proceedings as may be consistent with the Federal Rules of Civil Procedure and the district court's pre-trial orders with respect to the disclosure, supplementation, and amendment of expert opinions.

III. Conclusion

We dismiss the appeal on the denial of relief under Fed. R. Civ. P. 60(b) and reverse the grant of summary judgment. The case is remanded for further proceedings consistent with this opinion.

A true copy.

Attest:

CLERK, U.S. COURT OF APPEALS, EIGHTH CIRCUIT.