



## American Scientist

### Flying Versus Driving

Letter to the Editor, 91(2), March-April 2003

Return to  
Publications



To the Editors:

The central point of Sivak and Flannagan's article in the January-February issue "Flying and Driving after the September 11 Attacks" is on target – flying is generally much safer than driving. An important contributor to the higher risk in driving is that US road-safety policy has inappropriately devoted so much focus on increasing survivability when crashes occur, as described in my article "[Traffic Crashes](#)" in the May-June 2002 issue. Airline safety has improved so dramatically by correctly focusing on preventing, not surviving, crashes.

I do think the article overstates the admittedly large differences in risk between flying and driving. For distances for which there is a choice, the flying is likely on small aircraft operated by commuter airlines. These aircraft, and airlines, have higher fatality risks than large jets flown by major airlines. Commuter airline casualties were excluded from the fly versus drive comparison.

All passengers on an airlines flight have near identical risks, whereas driving risks vary enormously between drivers. A typical driver killed is a drunk unbelted 19-year old male driving at illegal speeds an hour or so after midnight. Typical airline passengers (and typical *American Scientist* readers) have personal profiles markedly different from those of drivers killed in traffic, and accordingly have far lower than average driving risk. Risks in driving, and also in flying, are however substantially higher than many other risks (tornadoes, chemicals, nuclear power) that attract much attention and resources.

Leonard Evans  
Science Serving Society  
Bloomfield Hills, Michigan

[Click here for photograph of airline occupancy on 9/11, 2002](#)

**LIST OF PUBLICATIONS --- Leonard Evans** (Revised 2017-09-21)

201. [Adverse Weather and Fatal Crashes Involving Large Numbers of Vehicles](#) (Authors: Ying Wang, Liming Liang, and Leonard Evans). [\(PDF !\[\]\(4e333a6106fc298d0ae6dff272a736ef\_img.jpg\)\)](#). **Journal of Safety Research**. 2017;63:1-7
200. [Traffic deaths before and after birth](#). (Authors: Leonard Evans and Donald A. Redelmeier). **European Journal of Obstetrics & Gynecology and Reproductive Biology**. 2015;194:258-259
199. [The Greatest Risk Your Child Faces](#). [\(PDF !\[\]\(97089f8e07e24e31baa67366e358a709\_img.jpg\)\)](#) **Pediatrics for Parents**: Vol 30, Numbers 1&2, April 2015. Also web version titled [The One Risk Your Child Faces That Nobody Talks About](#)
198. [Traffic Deaths and Driver Behavior - Eighty years of scientific research show that policies addressing how people drive have an effect on safety that overwhelms technological details](#). **Wall Street Journal, Letters to the Editor**, December 30, 2014
197. [U.S. Traffic Safety Misleads the Public: As GM ignition case shows, technology is emphasized over driver behavior](#), **USA TODAY opinion**, 19 September 2014, page 12A (also on [USA TODAY web](#) previous evening)
196. **Editorial**: [Twenty thousand more Americans killed annually because US traffic-safety policy rejects science](#). [\(PDF !\[\]\(9496824b8cff3a19f59b81b37b57d8b6\_img.jpg\)\)](#). **American Journal of Public Health**: August 2014, Vol. 104, No. 8, pp. 1349-1351.
195. [Traffic Fatality Reductions: United States Compared With 25 Other Countries](#) [\(PDF !\[\]\(ec8d0f7e486e2280c113cd85015a8548\_img.jpg\)\)](#). **American Journal of Public Health**: August 2014, Vol. 104, No. 8, pp. 1501-1507.
194. [Policy Implications from Comparing Traffic Fatality Trends Thru 2011 in 26 Countries \(or The Dramatic Failure of US Safety Policy Revisited\)](#), In P.Brieler and K Püschel (eds), Safe Mobility on Land, Sea and in the Air, Proceedings of the 23rd World Congress of International Traffic Medicine Association, Hamburg, Germany 19-22 May 2013. Verlag Dr. Kovac, Hamburg, 2014, p. 17-32
193. [Chinese Traffic Fatalities and Injuries in Police Reports, Hospital Records, and In-Depth Records from One City](#). (Authors: Jun Qiu, Ji-Hong Zhou, Liang Zhang, Yuan Yao, Dan-Feng Yuan, Jian-Guo Shi, Zhi-Ming Gao, Lin Zhou, Zheng-Guo Wang, and Leonard Evans). **Traffic Injury Prevention**: (2015) 16;565-570
- [192. Traffic Safety and the Driver \(1991\)](#) is made available (ISBN- 978-0975487136, January 2014) as [Kindle](#) download from [Amazon.com](#)

[191. \*Traffic Safety and the Driver \(1991\)\*](#) scanned page by page (long difficult job) so that it could be viewed electronically. Is made available (ISBN- 978-0975487181, December 2013) as print on demand paperback at [Amazon.com](#)

190. International Traffic-Fatality Rates - Comparisons Among 26 Countries Using Data Through 2011. Based on presentation to *Forum of Road Traffic Accident Prevention* organized by Chinese Academy of Engineering and sponsored by National Center of Engineering and Technology for Vehicle Driving Safety, Beijing, China, 13 Sept. 2012. Paper, which is major update and revision of oral presentation, is for inclusion in Proceedings of the Meeting.

189a. Obituary for Rune Andréasson, (1920-2013), **Traffic Injury Prevention**, web

189. Reducing Older Driver Deaths, In **Ageing America and Transportaton - Personal Choices and Public Policy**, J.F. Coughlin and L.A. D'Ambrosio (eds), p. 137-162

188. [Preface \(really Foreword\) \(PDF !\[\]\(a03a7eb2f4046e1d3c76772003e549ea\_img.jpg\)](#)) to *Traffic Crash Epidemiology (Huiqing JIN)*, Science Press, Beijing, China. ISBN 9787030360090, 2013, pages i-ii. ([click for photo of book](#))

187. [AAAM Former President Still Crash Free \(PDF !\[\]\(cbe2492b119e39e02a1dab2af4a4b296\_img.jpg\)](#)) INROADS (Bulletin of the AAAM), Vol 18, Issue 2, August 2012

186. Topsy-Turvy US Safety Policy Continues to Kill Thousands of Road Users. Presentation to *The Eyes and the Auto* International Conference, Detroit, MI, 2011-09-(12-14). (best to go to you [tube update](#) of similar material).

185. [Opinion: The Feds' Toyota Study Wasted More Than Money.](#) **AOL News**, 2010-12-03.

184. [Opinion: Here's An Easy Way to Make Traveling Much Safer.](#) **AOL News**, 2010-12-03.

183. [Opinion: Want Safer Football? Ditch the Helmet.](#) **AOL News**, 2010-10-23.

182. [Preface \(really Foreword\) \(PDF !\[\]\(4fe57c3593bf1b21d272ae7ac8dfaf77\_img.jpg\)](#)) to *Modern Traffic Medicine* (WANG Zhenguo ed), Chongqing Publishing House, Chongqing, China, ISBN 9787229039127, May 2011. Front material pages 1-2. ([click for photo of book](#))

181. [USA Traffic Safety Provides Examples Worth Copying and Worth Avoiding. \(PDF !\[\]\(0d5ec72f61334709c3fc9450209b754f\_img.jpg\)](#)). In *Modern Traffic Medicine* (WANG Zhenguo ed), Chongqing Publishing House, Chongqing, China, ISBN 9787229039127, May 2011. Special Contribution 1, pages 919-934.

180. [A Short History of the \*International Traffic Medicine Association \(ITMA\)\* \(PDF !\[\]\(b792654f2cef9719eabeb6c5be00811e\_img.jpg\)](#)). In *Modern Traffic Medicine* (WANG Zhenguo ed), Chongqing Publishing House, Chongqing, China, ISBN 9787229039127, May 2011. Pages 1-7.

179. [Opinion: Congress' Deadly Fixation on Toyota.](#) **AOL News**, 2010-02-25.

178. [Global warming snow job.](#) **Washington Times** ([web edition](#) , [image of printed edition -- easy to read](#)), 2010-02-15.

177. [Opinion: The Lesson of Toyota's Recall](#). **AOL News**, 2010-02-04.
176. [Opinion: Auto Technology That Kills](#). **AOL News**, 2010-01-11.
175. [Driver behavior, traffic safety & truck safety](#). In **Safety for the Long Haul: Large Truck Crash Risk, Causation & Prevention**, R.R. Knipling Editor, American Trucking Associations, Arlington, VA, p. 248, 2009
174. [Fueling Road Safety \(PDF\)](#). **adiNEWS**, p. 20-21, October 2008
173. [Safety First \(Letter to the editor\)](#). **American Scientist**, **96**(3); p. 180; May-June 2008
172. [Death in traffic: Why are the ethical issues ignored?\(PDF\)](#). **Studies in Ethics, Law and Technology** (a Peer Review Journal of the Berkeley Electronic Press), Vol. 2 : Issue. 1, Article 1, April 2008. Also available at: <http://www.bepress.com/selt/vol2/iss1/art1>
171. [Traffic deaths and fuel use - overwhelming influence is public policy, not vehicle characteristics](#). **American Journal of Public Health**. 97:588 (April 2007). (letter to the editor in response to article *Blood and oil: vehicle characteristics in relation to fatality risk and fuel economy* by Leon S. Robertson) ([PDF version click here](#); see also more extensive [electronic exchange](#)) See also [Swedish versus USA Traffic Safety: What Comparing Fatalities Tells Us](#)
170. [Drivers involved in crashes killing older road users \(PDF\)](#). SAE paper 2007-01-1165. Warrendale, PA: Society of Automotive Engineers, April 2007.
169. [Foreword to \*Shifting Out of Park: Moving Auto Safety from Recalls to Reason\* by Kevin M. McDonald](#) Lawyers & Judges Publishing Co., Toucan, Arizona. 2006.
168. Letter to the Editor re. *Death and Injury from Motor Vehicle Crashes: A Tale of Two Countries*. **American Journal of Preventive Medicine**. 30:532;2006
167. [Innate Sex Differences Supported by Untypical Traffic Fatalities](#). **Chance**. 19:10-16; Winter 2006.
166. [The Dramatic Failure of U.S. Safety Policy \(PDF\)](#). **TR News** (Transportation Research Board of the National Academies), 242: 28-31, January-February, 2006.  
(This article is based on [Chapter 15 The Dramatic Failure of U.S. Safety Policy](#) of [Traffic Safety](#))
165. [Robertson's review of Traffic Safety](#). **Injury Prevention**, 11: 383-384, December 2005. (see also more extensive [electronic exchange](#))
164. Gold mine for the city (*Titanic* centennial in 2012) (Letter to the Editor). **Belfast Telegraph**, 1 September 2005.
163. Higher speeds increase crash risk and severity (Letter to the Editor). **Local Transport Today (UK)**, Issue 423, p.17, 4 August 2005.

162. [CAFE and safety \(Letter to the editor\)](#). **American Scientist**, **93**(3); p. 198; May-June 2005
161. [Injuries in crashes -- Reported compared to actual \(PDF\)](#). SAE paper 2005-01-0294. Warrendale, PA: Society of Automotive Engineers, April 2005.
160. [Traffic Safety](#). Science Serving Society, Bloomfield Hills, Michigan, 2004.
159. [Airbag benefits, airbag costs \(PDF\)](#). SAE paper 2004-01-0840. Warrendale, PA: Society of Automotive Engineers, March 2004
158. [How to Make a Car Lighter and Safer \(PDF\)](#). SAE paper 2004-01-1172. Warrendale, PA: Society of Automotive Engineers, March 2004
157. [Evans responds to letters on roles of litigation and safety belts \(PDF\)](#). **American Journal of Public Health**. **94**:171-172, Feb. 2004.
- 156 [Make air bags a choice](#). Letter to the Editor, New York Times, 1 September 2003
155. [A new traffic safety vision for the United States \(PDF\)](#). **American Journal of Public Health**. **93**:1384-1386, Sept. 2003.
154. [Traffic-law enforcement and risk of death from motor-vehicle crashes: case-crossover study \(PDF\)](#). (Authors: Donald A Redelmeier, Robert J Tibshirani and Leonard Evans), **The Lancet**, **36**: 2177-2182, June 28, 2003
153. [Global warming claims seem to fall in line with cooling hoopla of '70s](#). Detroit Free Press, 21 April 2003
152. [Flying Versus Driving \(Letter to the editor\) \(PDF\)](#). **American Scientist**, **91**(2); p. 101; Mar-April 2003
151. [We need higher taxes on gas \(What would Jesus drive\)?](#) **San Francisco Examiner**, 9 December 2002
150. [A plan for traffic safety](#). **San Francisco Examiner**, 25 November 2002
149. [CAFE - why it is so difficult to estimate its effect on traffic fatalities and fuel use \(PDF\)](#). Presented to the **Transportation Research Board**, Washington, DC, 15 Jan. 2003
148. [Get rid of diamond lanes](#), **San Francisco Examiner**, 17 September 2002
- For more extensive discussion see [How to Increase Crash Risk, Fuel Consumption, and Exhaust Emissions](#)
- 147 [The foreign policy of S.U.V.'s](#), Letter to the Editor, New York Times, 22 October 2002
146. [Embrace new technology to boost traffic safety, save lives \(PDF\)](#). Detroit Free Press, 28 August 2002



145. [Transportation Safety \(PDF\)](#). In *Handbook of Transportation Science*, Second Edition, R.W. Hall Editor, Kluwer Academic Publishers, Norwell, MA, 67-112, 2002.
144. [Author replies to Letters to Editor, American Scientist \(PDF\)](#). 90, no. 4: 300-301 July-Aug 2002
143. Traffic crashes, **American Scientist**, 90, no. 3:244-253 May-June 2002 **Complete text without figures (For copyright reasons figures cannot be posted on Internet - reprint available from author)**
142. [Reading safety gauges](#), **Washington Times**, 2 March 2002
141. [Driving and human health](#) (Letter to the editor). **American Scientist**, 90(1); pages 4-5, Jan-Feb 2002
140. [Causal influence of car mass and size on driver fatality risk \(PDF\)](#). **American Journal of Public Health**, 91:1076-81; July 2001
139. [Gender and age influence on fatality risk from the same physical impact determined using two-car crashes \(PDF\)](#). (Authors: Leonard Evans and Peter H. Gerrish), SAE paper 011174. Warrendale, PA: Society of Automotive Engineers; March 2001. (Also included in: *Vehicle Aggressivity and Compatibility in Automotive Crashes*. SAE special publication SP-1601, 2001).
138. [Age and Fatality Risk from Similar Severity Impacts \(PDF\)](#). **Journal of Traffic Medicine**, 29: 10-19, 2001.
137. [Female Compared to Male Fatality Risk from Similar Physical Impacts \(PDF\)](#). **Journal of Trauma**, 50:281-8, 2001
- 136 Short "Letter to the Editor" on vice-presidential debate, *New York Times*, 7 October 2000.
135. Traffic Safety Trends, International Comparisons, and Major Factors. *Chinese Journal of Traumatology (English Edition)*, Vol. 2, Supplement, 10-13, November 1999.
- 134 [Transportation Safety \(PDF\)](#). In *Handbook of Transportation Science*, R.W. Hall Editor, Kluwer Academic Publishers, Norwell, MA, 1999. pp. 63-108. (link now points to second edition, #143, published in 2002)
133. [Risks older drivers face themselves and threats they pose to other road users \(PDF\)](#). **International Journal of Epidemiology**, 29: 315 - 322; 2000
132. Age dependence of female to male fatality risk in the same crash: an independent reexamination. **Crash Prevention and Injury Control**, 2: 111-121; 2000.
131. [What's in a word? \(Letter to the editor\) \(PDF\)](#). **Journal of Traffic Medicine**, 27: 3-4, 1999
130. [Global warming has you down? Then wait 5 minutes. Detroit News, 26 January 1999](#)

129. Epidemiology of the older driver -- some preliminary findings from data through 1996 (Authors: Leonard Evans, Peter H. Gerrish and Bahram Taheri), Proceedings of the 16th International Conference on the Enhanced Safety of Vehicles, Windsor, Canada, 1-4 June 1998, Volume 2, 1496-1507, publication DOT HS 080 759, 1998.
128. [Antilock brake systems and risk of different types of crashes in traffic\(PDF\)](#) **Crash Prevention and Injury Control**, 1:5-23, 1999 (Reassigned to **Traffic Injury Prevention**, 1:5-23, 1999)
127. [Air bags have been oversold](#). **Plain Dealer**, 16 Nov. 1997
126. [Air bags -- Even the smartest technology is a dumb](#), dangerous mandate. **Detroit Free Press**, 16 June 1997
125. [Offering motorists the airbag option](#). **Washington Times**, 8 June 1997
124. Evans Responds (reply to comment on #119 below). **American Journal of Public Health** 87: 872; 1997
123. Accidents in History, book review. **British Medical Journal** 315:p. 319, 2 August 1997.
122. Traffic Safety: Historical Trends and Future Prospects. **New Engineering** (Journal of the Institute of Engineers of Ireland), Cover and p 6-133, April 1997 (based on inaugural Manning Lecture, Dublin, Ireland, 10 Sept. 1996)
121. A Crash Course in Traffic Safety. **Encyclopædia Britannica Medical and Health Annual**, p.126-139;1997
120. [The dominant role of driver behavior in traffic safety \(PDF\)](#): Comment. **American Journal of Public Health** 86:784-785; 1996.
119. Higher speed limits raise fatality risk. **New York Times** (Letter to the Editor), 28 July 1995
118. Antilock brakes and risk of front and rear impact in two-vehicle crashes. (Authors: Leonard Evans and Peter H. Gerrish). **Accident Analysis and Prevention** 28:315-323;1996
117. Traffic safety measures, driver behavior responses, and surprising outcomes. 5th Westminster Lecture, Parliamentary Advisory Council for Transport Safety (PACTS, Queen Elizabeth II Conference Center, London SW1, 6 December 1994; **Journal of Traffic Medicine** 24: 5-15;1996.
116. How we know safety belts reduce injury and fatality risks. SAE paper 950241. Warrendale, PA: Society of Automotive Engineers; February 1995.
115. ABS and relative crash risk under different roadway, weather, and other conditions. SAE paper 950353. Warrendale, PA: Society of Automotive Engineers; February 1995. (Also included in: Accident Reconstruction: Technology and Animation V, SAE Special Publication SP-1083, p. 177-186; 1995).
114. Cycle helmets and the law (editorial). **British Medical Journal**, 308, 1521-1522, June 11 1994.
113. Small cars, big cars: what is the safety difference? **Chance -- New Directions for Statistics and**

**Computing**, a journal of the American Statistical Association. Vol. 7, No. 3, p 9-16, Summer 1994.

112. The older driver problem: an epidemiological overview. Proceedings of the 14th Enhanced Safety of Vehicles Conference, Munich, Germany, 23-26 May 1994, US Government Printing Office: 1995-381-067, Vol. 1, p 389-398, 1995.

111. Car size and safety -- a review focused on identifying causative factors. Proceedings of the 14th Enhanced Safety of Vehicles Conference, Munich, Germany, 23-26 May 1994, US Government Printing Office: 1995-381-067, Vol. 1, p 721-733, 1995.

110. Approaches to reducing harm from traffic crashes (editorial). **Journal of Traffic Medicine** 23:49-51; 1994

109. Safety-belt effectiveness: the influence of crash severity and selective recruitment, **Accident Analysis and Prevention** 28: 423-433; 1996

108. [Medical accidents: no such thing? \(editorial\) \(PDF !\[\]\(cbe2492b119e39e02a1dab2af4a4b296\_img.jpg\)\)](#). British Medical Journal 307: 1438-1439; 4 December 1993.

107. Driver injury and fatality risk in two-car crashes versus mass ratio inferred using Newtonian Mechanics. **Accident Analysis and Prevention** 26:609-616; 1994.

106. Review of *Confronting Drunk Driving: Social Policy for Saving Lives* by H. Larry Ross. **Journal of Traffic Medicine** 21: 139-141; 1993.

105. Comments on driver behavior and its role in traffic crashes. **Alcohol, Drugs and Driving** 9, Nos 3-4, p 185-195, 1993.

104. [How safe were today's older drivers when they were younger? \(PDF !\[\]\(870f5d5e9c0d57485634be3ecf52f3ca\_img.jpg\)\)](#). **American Journal of Epidemiology** 137: 769-775; 1993.

103. Evans Responds (reply to comment on #97 below). **American Journal of Public Health** 83: 769-770; 1993.

102. Future predictions and traffic safety research. **Transportation Quarterly** 47: 3-18; 1993. Based on talk *The future of traffic, traffic safety, and traffic safety research*, included in Proceedings of the National Road Safety Seminar, Plenary Session Papers, p 129-142, Wellington, New Zealand, 2-4 November 1992.

101. Is there really an older driver problem? Proceedings of the National Road Safety Seminar, Volume 1, p 273-284, Wellington, New Zealand, 2-4 November 1992.

100. Car mass and fatality risk -- has the relationship changed? (Authors: Leonard Evans and Michael C. Frick). **American Journal of Public Health** 84: 33-36; 1994.

99. Science, action, and making the world better (editorial). **Journal of Traffic Medicine**, 20: 1-3; 1992.

98. Car size or car mass -- which has greater influence on fatality risk? (Authors: Leonard Evans and Michael C. Frick). **American Journal of Public Health** 82: 1009-1112; 1992.



97. Mass ratio and relative driver fatality risk in two-vehicle crashes. (Authors: Leonard Evans and Michael C. Frick). **Accident Analysis and Prevention** 25: 213-224; 1993.
96. [\*Traffic Safety and the Driver.\*](#) Van Nostrand Reinhold, New York, 1991.
95. Driver fatality risk in two-car crashes -- dependence on masses of driven and striking car. (Authors: Leonard Evans and Michael C. Frick). Proceedings of the 13th International Technical Conference on Experimental Safety Vehicles, Paris, France, 4-7 November 1991, Document DOT HS 807 990, Washington DC, Vol. 1, p 83-93, July 1993.
94. Alcohol's contribution to traffic-crash losses and consequent monetary costs. **Alcohol, Drugs and Driving**, Special Issue, c. 1995 (undated), p 5-17.
93. [Alcohol's effect on fatality risk from a physical insult. \(PDF !\[\]\(1207edb9a08751d3d55970560645ed23\_img.jpg\)\).](#) (Authors: Leonard Evans and Michael C. Frick). **Journal of Studies on Alcohol** 54: 441-449; 1993.
92. Factors influencing pedestrian and motorcyclist fatality risk. **Journal of Traffic Medicine** 19: 69-73; 1991.
91. Older driver risks to themselves and to other road users. **Transportation Research Record** 1325: 34-41; 1991.
90. Improving traffic safety. **The Private Carrier**, May 1990
89. Thoughts on the possibility of a grand unification of traffic science. **IATSS Research (Journal of International Association of Traffic and Safety Sciences, Japan)** 14: 112-115; 1990.
88. Motorized two-point safety belt effectiveness in preventing fatalities. **Accident Analysis and Prevention** 23: 165-174; 1991.
87. Discussion of "The problem of compatibility in car-to-car collisions" by Thomas et al., Proceedings of the 34th Annual Meeting of the Association for the Advancement of Automotive Medicine (pages 269-273), Scottsdale, AZ, 1-3, October 1990.
86. Is it safer to fly or drive? -- a problem in risk communication. (Authors: Leonard Evans, Michael C. Frick and Richard C. Schwing). **Risk Analysis** 10: 239-246; 1990.
85. An attempt to categorize the main determinants of traffic safety. **Health Education Quarterly** 5: 111-124; 1990.
84. [The fraction of traffic fatalities attributable to alcohol \(PDF !\[\]\(d7a34a706cfa4ef37c62a369101e1b36\_img.jpg\)\).](#) **Accident Analysis and Prevention** 22: 587-602; 1990.
83. Involvement of older drivers in multivehicle side-impact crashes. (Authors: David C. Viano, Clide C. Culver, Leonard Evans, Michael C. Frick and Robert Scott. **Accident Analysis and Prevention** 22: 177-199; 1990.
82. Passive compared to active approaches to reducing occupant fatalities. Proceedings of the Twelfth International Technical Conference on Experimental Safety Vehicles, Gothenburg, Sweden, 29 May - 1 June 1989, U.S. Department of Transportation, National Highway Traffic Safety Administration, Vol. 2, p. 1149-1157.

81. Airbag effectiveness in preventing fatalities predicted according to type of crash, driver age, and blood alcohol concentration. **Accident Analysis and Prevention** 23: 531-541; 1991.
80. [Restraint effectiveness, occupant ejection from cars, and fatality reductions \(PDF !\[\]\(467d80e979964f7f8c752fb22248b5b7\_img.jpg\)\)](#). **Accident Analysis and Prevention** 22: 167-175; 1990.
79. Potential fatality reductions through eliminating occupant ejection from cars. (Authors: Leonard Evans and Michael C. Frick). **Accident Analysis and Prevention** 21: 169-182; 1989.
78. The science of traffic safety. **The Physics Teacher** 26: 426-431 (also, color photo on cover), October 1988.
77. Older driver involvement in fatal and severe traffic crashes. **The Journal of Gerontology: Social Sciences** 43: S186-S193; 1988.
76. Age and sex effects on severe and fatal injury rates in traffic crashes. SAE paper No. 885053, Twenty-second FISITA Congress, Dearborn, Michigan, September 1988, Society of Automotive Engineers Publication P-211, Vol. 1, pages 434-442.
75. Comments (on two papers on mandatory safety belt use laws, and reflections on broader issues). In: Preventing **Automobile Injury -- New Findings from Evaluation Research**, John D. Graham (ed), Auburn House, Dover MA, pp. 73-83, 1988.
74. Relative fatality risk in different seating positions versus car model year. (Authors: Leonard Evans and Michael C. Frick). **Analysis and Prevention** 21: 581-587; 1989.
73. Seating position in cars and fatality risk, (Authors: Leonard Evans and Michael C. Frick). **The American Journal of Public Health** 78: 1456-1458, November 1988.
72. Occupant protection device effectiveness in preventing fatalities. Proceedings of the Eleventh International Technical Conference on Experimental Safety Vehicles, Washington, D.C., May 12-15, 1987; U.S. Department of Transportation, National Highway Traffic Safety Administration, DOT HS 807 233, p. 220-227, November 1988.
71. Risk of fatality from physical trauma versus sex and age. **The Journal of Trauma** 28: 368-378; 1988.
70. Helmet effectiveness in preventing motorcycle driver and passenger fatalities. (Authors: Leonard Evans and Michael C. Frick). **Accident Analysis and Prevention** 20: 447-458; 1988.
69. Rear seat restraint system effectiveness in preventing fatalities. **Accident Analysis and Prevention** 20: 129-136; 1988.
68. Examination of some possible biases in double pair comparison estimates of safety belt effectiveness. **Accident Analysis and Prevention** 20: 215-218; 1988.
67. Review of *Road Accident Statistics* by T.P. Huchinson. **Transportation Science** 22: 290-291; 1988.
66. Young driver involvement in severe car crashes. **Alcohol, Drugs and Driving** 3: 63-78: 1987.

65. Fatal and severe crash involvement versus driver age and sex, 31st Annual Proceedings of the American Association for Automotive Medicine, New Orleans, Sept. 28-30, p. 59-77, 1987.
64. Rear compared to front seat restraint system effectiveness in preventing fatalities. Society of Automobile Engineers, Paper No. 870485, Detroit, February 1987. Included in SAE Special Publication SP-691.
63. Occupant protection device effectiveness -- some conceptual considerations. **Journal of Safety Research** 18: 137-144; 1987.
62. Estimating fatality reductions from increased safety belt use. **Risk Analysis** 7: 49-57; 1987.
61. Belted and unbelted driver accident involvement rates compared. **Journal of Safety Research** 18: 57-64; 1987.
60. Fatality risk reduction from safety belt use. **The Journal of Trauma** 27: 746-749; 1987.
59. Factors controlling traffic crashes. **Journal of Applied Behavioral Science** 23: 201-218; 1987.
58. Motorcyclist fatalities and the repeal of mandatory helmet wearing laws. (Authors: Thomas C. Chenier and Leonard Evans) **Accident Analysis and Prevention** 19: 133-139; 1987.
57. Serious or fatal driver injury rate versus car mass in head-on crashes between cars of similar mass. (Authors: Leonard Evans and Paul Wasielewski). **Accident Analysis and Prevention** 19: 119-131; 1987.
56. The effectiveness of safety belts in preventing fatalities. **Accident Analysis and Prevention** 18: 229-241; 1986.
55. Double pair comparison -- a new method to determine how occupant characteristics affect fatality risk in traffic crashes. **Accident Analysis and Prevention** 18: 217-227; 1986.
54. Car size and safety: results from analyzing U.S. accident data. Proceedings of the Tenth International Technical Conference on Experimental Safety Vehicles, Oxford, England, July 1-4, 1985; U.S. Department of Transportation, National Highway Traffic Safety Administration, DOT HS 806 916, p. 548-556, February 1986.
53. Safety belt effectiveness in preventing driver fatalities versus a number of vehicular, accident, roadway and environmental factors. (Authors: Leonard Evans and Michael C. Frick). **Journal of Safety Research** 17: 143-154; 1986.
52. Risk homeostasis theory and traffic accident data. **Risk Analysis** 6: 81-94; 1986; (also, in same issue, comments on Wilde's notes on "Risk homeostasis and traffic accident data", p. 103-107).
51. Post symposium reflections (comments on problems and issues in traffic safety research). In: **Human Behavior and Traffic Safety**, L. Evans and R.C. Schwing (eds), Plenum Press, New York, 525-529, 1985.
50. Driver behavior revealed in relations involving car mass, In: **Human Behavior and Traffic Safety**, L. Evans and R.C. Schwing (eds), Plenum Press, New York, p. 337-352, 1985.

49. **Human Behavior and Traffic Safety**. Edited by Leonard Evans and Richard C. Schwing, Plenum Press, New York, 1985.
48. Driver age, car mass and accident exposure -- a synthesis of available data. **Accident Analysis and Prevention** 17: 439-448; 1985.
47. Human behavior feedback and traffic safety. **Human Factors** 27: 555-576; 1985.
46. Fatality risk for belted drivers versus car mass. **Accident Analysis and Prevention** 17: 251-271; 1985.
45. Involvement rate in two-car crashes versus driver age and car mass of each involved car. **Accident Analysis and Prevention** 17: 155-170; 1985.
44. A statistical approach to estimating driver responsibility in two-car crashes. (Authors: Paul Wasielewski and Leonard Evans) **Journal of Safety Research** 16, 37-48; 1985.
43. [Do drivers of small cars take less risk in everyday driving? \(PDF !\[\]\(a22ba4e13c745edbf29e51af246c4c12\_img.jpg\)\)](#) (Authors: Leonard Evans and Paul Wasielewski) **Risk Analysis** 5: 25-32; 1985.
42. Accident involvement rate and car size. **Accident Analysis and Prevention** 16: 387-405; 1984.
41. [The role and duties of a meeting chair – Letter to the Editor \(PDF !\[\]\(33b18af9a4b997eb52666cfeb3c44157\_img.jpg\)\)](#). Human Factors Society Bulletin, 27, no. 12, Dec. 1984
40. Driver fatalities versus car mass using a new exposure approach. **Accident Analysis and Prevention** 16: 19-36; 1984.
39. Car occupant life expectancy: car mass and seat belt effects. (Authors: Leonard Evans and Dennis E. Blumenfeld). **Risk Analysis** 2: 259-268; 1983.
38. Uncertainties in diesel engine health effects (a comment on two papers). (Authors: Leonard Evans, Richard C. Schwing and Richard M. Schreck). **Risk Analysis** 3: 129-131; 1983.
37. Risky driving related to driver and vehicle characteristics. (Authors: Leonard Evans and Paul Wasielewski.) **Accident Analysis and Prevention** 15: 121-136; 1983.
36. [Influence of vehicle size and performance on intersection capacity](#). (Authors: Leonard Evans and Richard Rothery). Proceedings of the Eighth International Symposium on Transportation and Traffic Theory. Edited by V. F. Hurdle, E. Hauer and G. N. Steuart, University of Toronto Press, 1983.
35. Car mass and likelihood of occupant fatality. Society of Automotive Engineers, Paper No. 820807, June 1982.
34. Compulsory seat belt usage and driver risk taking behavior. (Authors: Leonard Evans, Paul Wasielewski and Calvin R. von Buseck). **Human Factors** 24: 41-48; 1982.
33. Do accident-involved drivers exhibit riskier everyday driving behavior. (Authors: Leonard Evans and Paul Wasielewski). **Accident Analysis and Prevention** 14: 57-64; 1982.

32. Fuel used to accelerate vehicles from rest to cruising speeds. (Authors: Leonard Evans and Gerald M. Takasaki). Society of Automotive Engineers, Paper No. 810781, June 1981; also published in **SAE Transactions** 90: 2385-2394; 1981.
31. Automobile braking energy, acceleration and speed in city traffic. (Authors: Leonard Evans, and Paul Wasielewski and Man-Feng Chang) Society of Automobile Engineers, Paper No. 800795, June 1980.
30. Seat belt usage and risk taking in driver behavior. (Authors: Calvin R. von Buseck, Leonard Evans, Donald E. Schmidt and Paul Wasielewski. Society of Automotive Engineers Special Publication SP-461, February 1980; also published in **SAE Transactions** 89: 1529-1533; 1980.
29. How does traffic speed affect urban fuel consumption? **Institute of Transportation Engineers (ITE) Journal**, 12-13, June 1979 (also see September issue, p. 11 for corrections to printing errors in June issue).
28. Exhaust emissions, fuel consumption and traffic: relations derived from urban driving schedule data. **Transportation Research Record** 714: 24-30; 1979.
27. [Driver behavior effects on fuel consumption in urban driving.\(PDF !\[\]\(3da2b303d29c1ea489bbe26a3f5ac664\_img.jpg\)\).](#) **Human Factors** 21: 389-398; 1979.
26. Urban traffic, fuel economy and emissions: consistency of various measurements, Society of Automotive Engineers Paper No. 780934, Nov. 1978; also published in **SAE Transactions** 87: 3378-3388; 1979. Included in SAE Progress in Technology Series No. 18 **Automotive Fuel Economy** (Part 2).
25. The why and how of the (metric) system of units. **Human Factors Society Bulletin** 21:3-5; 1978.
24. Urban fuel economy: an alternate interpretation of recent computer simulation calculations. (Authors: Leonard Evans and Robert Herman. **Transportation Research** 12: 163-165; 1978.
23. Automobile fuel economy on fixed urban driving schedules. (Authors: Leonard Evans and Robert Herman). **Transportation Science** 12: 137-152; 1978.
22. Observations of fuel savings due to the introduction of right-turn-on-red. (Authors: Man-Feng Chang, Leonard Evans, Robert Herman and Paul Wasielewski). **Traffic Engineering and Control** 18: 1-3; 1977.
21. Perceptual thresholds in car-following -- a comparison of recent measurements with earlier results. (Authors: Leonard Evans and Richard Rothery). **Transportation Science** 11: 60-72; 1977.
20. Fuel consumption and right turn on red: comparison between simple model results and computer simulation. (Co-authored with Man-Feng Chang, Robert Herman and Paul Wasielewski. Letter to the editor, **Transportation Science** 11: 92-94; 1977.
19. Gasoline consumption in urban traffic. (Authors: Man-Feng Chang, Leonard Evans, Robert Herman and Paul Wasielewski) **Transportation Research Record** 559: 25-30; 1977.
18. Comments on effects of vehicle type and age on driver behaviour at signalized intersections. (Authors: Leonard Evans and Richard Rothery). **Ergonomics** 19: 559-570; 1976.



17. Note on driver adaptation to modified vehicle starting acceleration. (Authors: Leonard Evans and Robert Herman). **Human Factors** 18: 235-240; 1976.
16. A simplified approach to calculations of fuel consumption in urban traffic systems. (Authors: Leonard Evans and Robert Herman). **Traffic Engineering and Control** 17: 352-354; 1976.
15. Chapter on metric units for HUMAN FACTORS journal *Manual of Style*. May 1976.
14. Multivariate analysis of traffic factors related to fuel consumption in urban driving. (Authors: Leonard Evans, Robert Herman and Tenny N. Lam). **Transportation Science** 10: 2, 205-215; 1976.
13. Metric system usage in HUMAN FACTORS and elsewhere. **Human Factors Society Bulletin** 19: 2, 3-4; 1976.
12. The influence of forward vision and target size on apparent inter-vehicular spacing. (Authors: Leonard Evans and Richard Rothery). **Transportation Science** 10: 85-101; 1976.
11. Gasoline consumption in urban traffic. (Authors: Leonard Evans, Robert Herman and Tenny N. Lam.) Society of Automotive Engineers Paper No. 760048, February, 1976.
10. Experimental measurement of perceptual thresholds in car-following. (Authors: Leonard Evans and Richard Rothery). **Highway Research Board Record** 464: 13-29; 1973.
9. Diagonal and off-diagonal hyperfine structure in the ground multiplets of boron and aluminum by the atomic beam method: magnetic dipole radial parameters. (Authors: J. S. M. Harvey, Leonard Evans and Hin Lew). **Canadian Journal of Physics** 50: 1719-1727; 1972.
8. Detection of the sign of relative motion when following a vehicle. (Authors: Leonard Evans and Richard Rothery). **Human Factors** 16: 161-173; 1974.
7. On "rotating" ellipses inside triangles. **Mathematics Magazine** 44: 28-33; 1971.
6. Automobile speed estimation using movie-film simulation. **Ergonomics** 13: 231-237; 1970.
5. Speed estimation from a moving automobile. **Ergonomics** 13: 219-230; 1970.
4. Frequency shifts in atomic beam experiments. **Physical Review** 178: 430-431; 1969.
3. Relativistic effects in many electron hyperfine structure III. Relativistic dipole and quadrupole interaction in europium and remeasurement of the nuclear magnetic dipole moments of  $^{151}\text{Eu}$  and  $^{153}\text{Eu}$ . (Authors: Leonard Evans, P. G. H. Sandars and G. K. Woodgate). **Proceedings of the Royal Society A** 289: 114-121; 1965.
2. Relativistic effects in many electron hyperfine structure, II. Relativistic quadrupole interaction in Manganese. (Authors: Leonard Evans, P. G. H. Sandars and G. K. Woodgate). **Proceedings of the Royal Society A** 289: 108-113; 1965.
1. A radioactive test for psycho-kinesis. (Authors: John Beloff and Leonard Evans). **Journal of the Society for Psychical Research** 41: 41-26; 1961 (For this first Evans publication, Evans was student, Beloff was faculty in an

unrelated Department -- but they pursued an idea together on an informal basis). Is described in [Obituary for Professor Beloff \(PDF !\[\]\(529949c2c3dadbaa4e538e8c643454bc\_img.jpg\)\)](#).

*Revised 2017-10-10*

**Traffic Safety**

[Bio](#)

[Latest Traffic Safety Youtube](#)

Return to [Publications](#)

[List of journals containing publications by Leonard Evans](#)

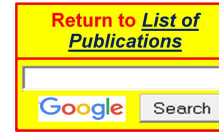




## American Scientist

### Flying Versus Driving

Letter to the Editor, 91(2), March-April 2003



To the Editors:

The central point of Sivak and Flannagan's article in the January-February issue "Flying and Driving after the September 11 Attacks" is on target – flying is generally much safer than driving. An important contributor to the higher risk in driving is that US road-safety policy has inappropriately devoted so much focus on increasing survivability when crashes occur, as described in my article "[Traffic Crashes](#)" in the May-June 2002 issue. Airline safety has improved so dramatically by correctly focusing on preventing, not surviving, crashes.

I do think the article overstates the admittedly large differences in risk between flying and driving. For distances for which there is a choice, the flying is likely on small aircraft operated by commuter airlines. These aircraft, and airlines, have higher fatality risks than large jets flown by major airlines. Commuter airline casualties were excluded from the fly versus drive comparison.

All passengers on an airlines flight have near identical risks, whereas driving risks vary enormously between drivers. A typical driver killed is a drunk unbelted 19-year old male driving at illegal speeds an hour or so after midnight. Typical airline passengers (and typical *American Scientist* readers) have personal profiles markedly different from those of drivers killed in traffic, and accordingly have far lower than average driving risk. Risks in driving, and also in flying, are however substantially higher than many other risks (tornadoes, chemicals, nuclear power) that attract much attention and resources.

Leonard Evans  
Science Serving Society  
Bloomfield Hills, Michigan

[Click here for photograph of airline occupancy on 9/11, 2002](#)