Why Young Men Drive Dangerously: Implications for Injury Prevention

Victor Nell[1]

Institute for Social and Health Sciences, University of South Africa, Johannesburg, South Africa

Abstract

Why is risk consistently underestimated, and why do young men in particular take exceptionally high risks and think of themselves as invulnerable? Two explanatory paths are proposed. The first is that risk taking in young males has been shaped by evolutionary forces to provide a fitness value. The second pathway is through myth and the other narrative forms that affirm the ego's immortality and invulnerability. Because of its evolutionary base, risk taking is emotionally driven: Emotions are preverbal and irrational, which means that persuasive prevention cannot be more than weakly successful. Three prevention challenges emerge from this analysis: to determine what it is that young drivers fear, to attach affectively experienced fears to defined driving behaviors, and to devise injury-prevention programs that acknowledge that young males' risk taking is not "stupid," but driven by adaptive needs that are as significant to today's young adults as they were to our distant ancestors.

Keywords

risk taking; immortality; evolution; fear; sensation seeking; driving

Injury prevention is a young, epidemiologically sophisticated, but largely atheoretical discipline. In this survey, I seek to augment injury-prevention theory by sketching the evolved motivational structures and cultural reinforcers that escalate risk taking in young men, and the implications of this approach for the development of strategies for attenuating risk.

These are socially significant issues. For example, 1987 data for the United States show that although there are 26.9 deaths per 100,000 individuals per year among early adolescents (ages 10–14), the death rate for late adolescence (ages 15–19) is 84.6 deaths per 100,000 individuals per year—more than three times higher. As teenagers move from early to late adolescence, males die at twice the rate of females, with a 525% increase in deaths by homicide and legal intervention. In 1994, irrespective of age, 2.86 times as many males as females died in automobile crashes, and twice as many males as females involved in car accidents had a blood alcohol content in excess of 0.10 g/L blood (U.S. Department of Transportation, 1996, Table 16). Among 16- to 20-year-olds, 44.31 males per 100,000 population were in fatal automobile crashes, compared with 20.43 per 100,000 females; in the 21- to 24-year-old age group, the incidences were 42.52 and 14.02 among males and females, respectively (U.S. Department of Transportation, 1996, Table 56). Although the total number of traffic fatalities has a U-shaped relation to age, peaking in youth and old age, fatalities related to both age and a risk-taking behavior, for example, automobile fatalities that occur while the driver is speeding, decline linearly from youth to old age (Fig. 1).

RISK TAKING AS AN ADAPTATION

What is the motivational basis for risk taking among young males? To answer this question, it is useful to consider human evolution, the personality trait of sensation seeking, and myth.

Intraspecific Competition

Intraspecific competition is as old as life itself. In the "prebiotic soup" of the Hadean era some 4 million years ago, self-replicating systems of RNA molecules competed for the available precursor materials to construct copies of themselves; in the next evolutionary step, one of these RNA molecule families developed protein synthesis (Alberts et al., 1989, p. 8). The first primordial cell, from which all life on earth is descended, was a benthic procaryote born 3 billion years ago: "This cell, outreproducing its competitors, took the lead in the process of cell division and evolution" that made the world we know (Alberts et al., 1989, p. 10).

Beginning in the Mesozoic some 200 million years ago, competition has continued to drive mammalian evolution. Moving from intraspecific competitiveness to intraspecific aggression is a small step, and aggression emerges as a fitness value at the earliest evolutionary levels. It is especially prominent in *Phylum chordata*, and universal in the carnivore and primate orders. Human beings are innately aggressive (Wilson, 1978/1995, p. 99), and when young males reach the mating and fighting age, the biological platform that supports aggression is at its peak, preparing them for

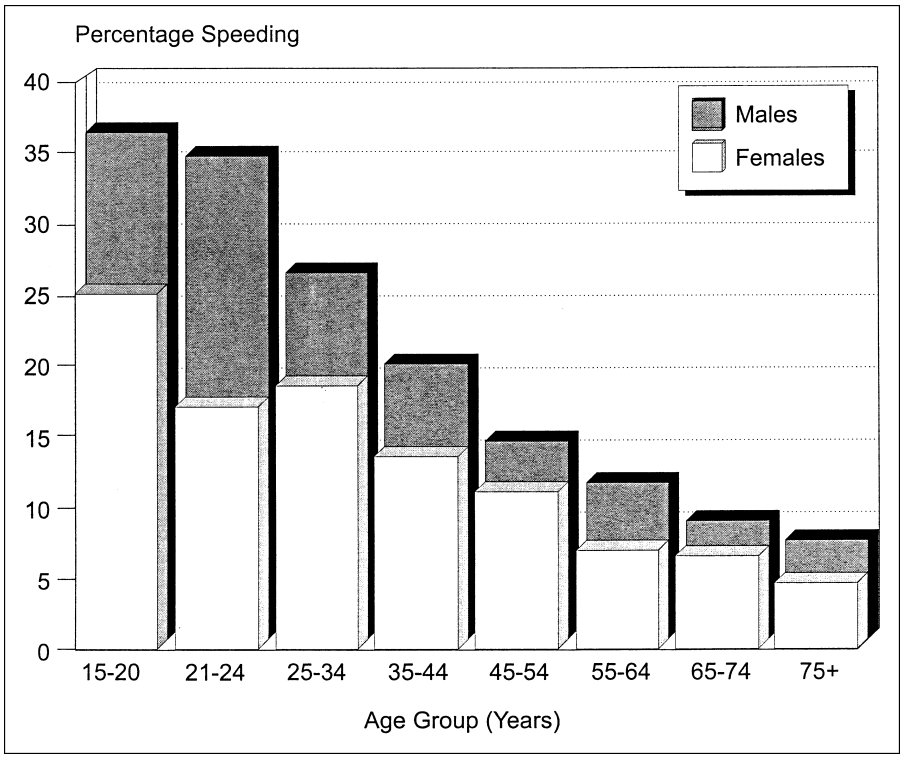

Fig. 1. Percentage of drivers who were speeding in fatal crashes in 1996, by age and sex. From U.S. Department of Transportation (1996, Fig. 4).

the survival tasks of a ruthlessly competitive social environment.

If risk were correctly appraised, and if death were to become real and terrifying, aggression—which always carries the risk of injury or death—would be impossible. Fear would triumph, and the fearful creature's genes would perish. Evolution has, on the contrary, so arranged matters that young males of virtually all species are biochemically prepared to fight for territorial advantage and physical dominance in order to win for themselves the most desirable mate. Insects, reptiles, ungulates, and primates show the same pattern (Wilson, 1975, pp. 323, 442–443, 493). Primates are notoriously aggressive: "If hamadryas baboons had nuclear weapons, they would destroy the world in a week" (Wilson, 1978/1995, p. 104; also see Wrangham & Peterson, 1996, especially pp. 5–18). For humans, there is a weight of historical and contemporary evidence that human aggression, risk taking, and blood lust, from the Assyrian lion hunts in the seventh century B.C. to the Roman arena (from the second century B.C. through to the fifth century A.D.) and today's genocides in Rwanda and the Balkans, has not changed over the centuries or become "more civilized."

Sensation Seeking and Risk Taking

The heightened sense of invulnerability of late adolescence correlates with heightened sensation seeking, "a trait defined by the seeking of varied, novel, and intense sensations and experiences and the willingness to take physical, social, legal, and financial risks for the sake of such experiences" (Zuckerman, 1994, p. 27). There are strong relations between sensation seeking and risky driving, with a direct linear relationship between reported driving speed and scores on measures of sensation seeking; Zuckerman (1994, p. 139) found the highest sensation-seeking scores among subjects who said they would drive over 75 mph on a clear road with a 55-mph limit. As noted in the introduction, crash statistics confirm these laboratory data.

The Biochemistry of Sensation Seeking

Given that risk taking and sensation seeking are universally higher in young males than in young females and attenuate with age (Zuckerman, 1994, pp. 104–105), they must have a biochemical basis. There is indeed a strong inverse relation between platelet monoamine oxidase (MAO, an enzyme regulating arousal and activity levels) and high scores on the Sensation Seeking Scale (Zuckerman, 1994, Table 11.3, p. 298). Low MAO levels also predict many real-life behaviors related to high sensation seeking (such as tobacco, drug, and alcohol use). Levels of the MAO enzyme gradually increase with age in the human brain, as well as in platelets and plasma, and are lower in men than in women. The situation is similar with the gonadal hormones. Male sensation seekers have unusually high levels of testosterone (Zuckerman, 1994).

Handicap as an Advantage in Sexual Selection

It seems preposterous to claim that risk taking, which is so often fatal or injurious, has a fitness value. This problem is as old as evolutionary theory. In his letters, Darwin wrote, "The sight of a feather in a peacock's tail, whenever I gaze at it, makes me sick" (cited in Cronin, 1991, p. 113). Such ornaments, unlike male strength and quickness, are in fact handicaps to

their bearers, as are the enormous jaws of the *Chiasognathus grantii* beetle of South Chile, which have a feeble bite, and stags' antlers. But these and other handicapping male traits might attract a female because they are handicaps, signaling a mating advantage to females of the species. That is, young men who do crazy things are saying in one voice with the peacock and the buck that prances when the lion approaches, "Look at me! I have so much strength and skill that I am fearless, I will survive no matter how much I drink or how fast I drive"; the handicaps (which include substance use) convey the message that the male can support high costs (Cronin, 1991).

Myth, Narrative, and the News

These evolutionary predisposers to risk taking are culturally reinforced by myth and its narrative derivatives. The hero's quest and redemption in grand myth are echoed by the fearless protagonists of the Norse sagas, and the invincible James Bonds of formulaic fiction and boys' adventure stories: In these everyday narratives—of which newspaper and television news are a subcategory—immortality is domesticated as hope, endlessly reaffirming the immortality of His Majesty the Ego (Nell, 2001). Narrative forms thus nurture the immortality delusion, giving further support to risk-taking behavior.

FEAR AS A RISK ATTENUATOR

What stands between risk taking and death is fear. At moderate intensity, fear is adaptive, preparing the organism to avoid or confront threat; at its highest intensity, fear is a paralyzing dread. Because intense fear is rarely felt in modern societies, its potency is underestimated. As a result, it is easy to confuse thinking about fear and feeling fear: This distinction between cognitive and emotional states is tellingly captured by contrasting hypnotic trance, daydreaming, and entertainment-industry inputs—in which the reader or listener may believe (a cognitive state)—with dreaming, which has an imperative reality—"I do not have the dream, it is the dream that has me" (Nell, 1988). The imperative reality of dreams arises from the emotional rather than the cognitive mechanisms that drive dreams—in other words, from subcortical rather than cortical circuits.[2]

The Neuroanatomy of Fear

There is convergent evidence from studies of the routes followed by neurotransmitters in the brain that fear responses are triggered by the central nucleus of the amygdala, which is part of the evolutionarily old limbic system[3] (LeDoux, 1998, p. 205). For both humans and animals, the advantage of these unconscious emotional reactions is that they provide a subcortical and therefore extremely rapid route from stimulus to fear response. LeDoux hypothesized that for both posttraumatic stress disorder and the phobias—as with other forms of panic—there are direct connections from subcortical processing areas to the amygdala. Learned fear is indelible. The fear response may with time extinguish, but will recur at its original intensity if triggered by the conditioned stimulus.

The memory of dread is elusive because it is implicit and nonverbal. Because the amygdala matures before the hippocampus, memories of childhood trauma are purely emotional and have no verbal declarative content (LeDoux, 1998); this rather than the Freudian mechanism of repression accounts for the elusiveness of early childhood experiences, and their power to invade and color the present.

"Fear Appeals Don't Work"

Despite the unequivocal evidence that fear is the most potent negative reinforcer, there is a widespread perception in traffic-safety circles that "fear appeals" do not work. An influential early study (Janis & Feshbach, 1953, as cited in Boster & Mongeau, 1984) found a negative relationship between the strength of the fear appeal and subsequent conformity with the recommendations. Boster and Mongeau (1984) found very small correlations between fear and attitudes toward risky driving (r = .21), and between fear and driving behavior (.10).

Given fear's potency, these findings make no sense. First, though shock and aversion are physiologically arousing, they are not fear, and it is specious to claim that exposing drivers to videos of crash victims and autopsies, as was done in these studies, is a fear appeal. Second, fear is an affective rather than a cognitive state. Safety videos—for example, the now-famous television advertisements on safe driving developed a decade ago by the Victoria Transport Accident Commission in Australia—operate in the rational and not the emotional modality. Such programs do not arouse fears of mortality, and the viewer's feelings of immortality are comfortably preserved. If fear appeals have not worked, it is because fear itself has not been tried.

DIRECTIONS FOR FUTURE RESEARCH

Can Fear Be Applied to the Reduction of Dangerous Driving?

Though fear is a potent negative reinforcer, there are three chal-

lenges that must be met if fear is to be used effectively in safe-driving programs. The first prevention challenge is to determine what it is that young drivers fear so as to develop feeling, rather than thinking, strategies—strategies that address the immortality delusion by triggering mortality fears in the experiential rather than the rational system (Epstein, 1994). Theoretical social psychology must determine what it is that young drivers do fear. Death is too remote to be feared: "One's own death is beyond imagining," wrote Freud (1915/1985), "and whenever we try to imagine it, we can see that we really survive as spectators . . . . At bottom, nobody believes in his own death" (p. 77; Nell, 2001). Why, then, is mortal danger flooded with fear and horror, and so desperately resisted? An evolutionary hypothesis is that in the environment of evolutionary adaptation, the most feared event was death by predation. Fear would thus have been attached not to death, but to the mutilation and pain that preceded death. Because "the brain systems that generate emotional behaviour are highly conserved through many levels of evolutionary history" (LeDoux, 1998, p. 17), this fear remains. Thus, fear of pain rather than fear of death would be an effective risk attenuator.

The second prevention challenge is to build on the huge existing literature on fear conditioning so as to apply mortality fears in socially and ethically acceptable ways to closely targeted risk behaviors and to demonstrate that fear thus applied will remain specific to these behaviors. This gives rise to a twofold ethical problem. First, fear conditioning evokes images of Stanley Kubrick's 1971 movie, *Clockwork Orange*, with Malcolm McDowell as the young hooligan strapped to a chair, eyes held forcibly open, while prison psychologists make him vomit while he watches scenes of violence. Risk attenuation cannot infringe on social norms regarding individual liberty and limits on state power. Second, mobility is a basic human right and a principle mechanism of economic development: Fear conditioning cannot be allowed to generalize in ways that might contaminate driving's utility and pleasure.

The Personal and Social Value of Risk Taking

Prevention that regards youthful risk taking as "stupid" will not prosper. At the individual level, risk is part of life. A life without risk is a life not worth living, empty of mastery, achievement, and social status. Injury-prevention initiatives are unlikely to succeed if they fail to acknowledge the youthful imperative to increase social status by courting danger to demonstrate courage. Driving represents "the most common form of sensation seeking in young men" (Zuckerman, 1994, p. 138) because it bypasses the genetic endowments of strength and speed and makes the demonstration of courage available to all young men, including the slow and the weak.

Risk taking is also a highly prized social virtue. Violent interband rivalry in the earliest phases of evolution made it essential for a group to have a contingent of "dawn warriors . . . . healthy, adventurous, and potentially violent young men" (Bailey, 1995, p. 542). Warrior traits are highly adaptive in combat: "The most brutal warrior hawks have the advantage over their less 'sociopathic' adversaries" (p. 542). Paramedics, firefighters, and police are drawn from these dawn warriors, and military establishments build on these traits, teaching young men to kill with their bare hands; sports coaches and corporate teambuilders teach that nice guys come last, and extol the killer instinct; bloodshed and death are the entertainment industry's principal commodity. Young people perceive the hypocrisy of asking them to give up their guns and disband their gangs while the social establishment entrenches risk taking and exploits it in the service of established authority.

Recognition of the fitness value and social utility of risk taking has the potential to bring about a reconceptualization of violence-prevention interventions, beginning with an acknowledgment of the hypocrisy of dismissing risk taking as adolescent immaturity. A third prevention challenge is thus to recognize that boys in early adolescence need to create their own hero's journey from childhood to adulthood that echoes the journeys of Odysseus and Luke Skywalker. Their need in making this journey is not for a protective mother, but for Iron John (Bly, 1990)—who knew both courage and fear.

Recommended Reading

Bly, R. (1990). (See References)
Marks, I., & Nesse, R. (1997). Fear and fitness: An evolutionary analysis of anxiety disorders. In S. Baron-Cohen (Ed.), *The maladapted mind: Classic readings in evolutionary psychopathology* (pp. 57–72). Hove, England: Psychology Press.
Mohan, D., & Tiwari, G. (Eds.). (2000). *Injury prevention and control*. London: Taylor and Francis.
Nell, V. (2001). (See References)
Wilson, E.O. (1995). (See References)

Notes

1. Address correspondence to Victor Nell, University of South Africa Institute for Social and Health Sciences, P.O. Box 72477, Parkview 2122, Johannesburg, South Africa; e-mail: victor.nell@iafrica.com.

2. The ancient subcortical regions of the brain are preverbal, and similarly organized in all mammals. The cortex is part of the more recently evolved neo-

mammalian brain. It is the seat of language and reasoning, and reaches its most elaborate development in humans.

3. The limbic system, within which the amygdala and hippocampus are located, is an ancient brain structure in the old mammalian brain. It is located deep within the temporal lobe, and among its many functions is the mediation of emotional experience. Implicit emotional memories are thought to be mediated by the amygdala, and explicit, conscious memories by the hippocampus.

References

Alberts, B., Bray, D., Lewis, J., Raff, M., Roberts, K., & Watson, J.D. (1989). *Molecular biology of the cell* (2nd ed.). New York: Garland.

Bailey, K.G. (1995). The sociopath: Cheater or warrior hawk. *Behavioural and Brain Sciences*, *18*, 542–543.

Bly, R. (1990). *Iron John: A book about men*. Reading, MA: Addison-Wesley.

Boster, F.J., & Mongeau, P. (1984). Fear-arousing persuasive messages. In R.N. Bostrom & B.H. Westley (Eds.), *Communication yearbook 8* (pp. 330–375). Newbury Park, CA: Sage.

Cronin, H. (1991). *The ant and the peacock: Altruism and sexual selection from Darwin to today*. Cambridge, England: Cambridge University Press.

Epstein, S. (1994). Integration of the cognitive and psychodynamic unconscious. *American Psychologist*, *49*, 709–724.

Freud, S. (1985). Thoughts for the times on war and death. In J. Strachey (Ed.), *Civilisation, society and religion* (pp. 57–90). Harmondsworth, England: Pelican. (Original work published 1915)

LeDoux, J. (1998). *The emotional brain*. London: Weidenfeld and Nicholson.

Nell, V. (1988). *Lost in a book: The psychology of reading for pleasure*. New Haven, CT: Yale University Press.

Nell, V. (2001). Mythic structures in narrative: Life, death, and immortality. In T. Brock, M. Green, & J. Strange (Eds.), *Narrative impact: Social and cognitive foundations* (pp. 17–37). Mahwah, NJ: Erlbaum.

U.S. Department of Transportation. (1996). *Traffic Safety CD-ROM, 1975–1994* (BTS-CD-10). Washington, DC: Bureau of Transportation Statistics.

Wilson, E.O. (1975). *Sociobiology: The new synthesis*. Cambridge, MA: Harvard.

Wilson, E.O. (1995). *On human nature*. Harmondsworth, England: Penguin. (Original work published 1978)

Wrangham, R., & Peterson, D. (1996). *Demonic males: Apes and the origins of human violence*. Boston: Houghton Mifflin.

Zuckerman, M. (1994). *Behavioural expressions and biosocial bases of sensation seeking*. Cambridge, England: Cambridge University Press.