

## The dark side of regulating behaviour: **The case of seat belt laws**

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Seat belt laws are a celebrated and oft-quoted social change success story. They produced a revolution in community behaviours in a remarkably short period of time and made us all a lot safer.

Or did they?

Australian states were the first to introduce mandatory seat belt laws in 1970-71. The effect was dramatic. Rates of seat belt use shot from 20-25 percent in 1970 to 75 percent in 1971, reaching 85-90 percent by the late 1970s, all with surprisingly little objection from drivers. Meanwhile traffic fatalities began a long steady period of decline.<sup>1</sup>

Propelled by the success of the Australian experiment, legislatures around the world followed suit. New Zealand followed in 1972, France in 1973, Spain and Sweden in 1975 and Germany in 1976. The UK resisted until 1983. Finally USA states began to fall in line. New York passed its law in 1984 and New Jersey in 1985. At first the laws only covered front seat occupants, but during the 1990s laws were expanded to include all occupants. By 1996 every US state except New Hampshire, which still resists, true to its motto "Live free or die", had mandated seat belt use.

Even in the USA, a nation notorious for its aversion to state intervention, the effects on behaviour have been striking. The number of buckled-up Americans has grown steadily year-by-year, reaching 81% in 2006. Eleven states now exceed 90% compliance rates.<sup>2</sup>

### **What made seat belt laws so successful?**

What accounts for the extraordinary take-up of a new behaviour which, after all, not only restricts individual liberty but also entails a degree of inconvenience?

Firstly, cars had already changed. By 1965 every US car maker had voluntarily installed front seat belts in new vehicles. Australian manufacturers followed in 1966.

Secondly, there was early grass-roots leadership, especially from prominent corporations and government authorities – notably the Snowy Mountains Authority in Australia – that insisted their employees belt up for safety reasons well before governments enacted laws.

Thirdly, there was considerable investment in public education. In Australia there were major radio and television campaigns in 1962 and 1964 which included the distribution of ten million or so posters and leaflets. Respected voices like vehicle manufacturers, police, surgeons, and medical associations lent their support to the campaign. Also, it was built around credible scientific studies which claimed 30-40% decreases in the likely risks of being killed or injured in an accident.

These campaigns had a strong effect on people's attitudes. A 1962 survey found 1 percent of Australians believed seat belts were an important road safety measure. By 1970, the year the first laws came into effect, the figure had ballooned to 75 percent, including almost two-thirds of people who never wore seat belts.<sup>3</sup> Before the laws were even passed, then, the overwhelming majority of Australians supported them. Americans were subjected to similar "science-based" campaigns by traffic, medical and insurance authorities, although support was lower because libertarian groups had time to organise campaigns against the laws.

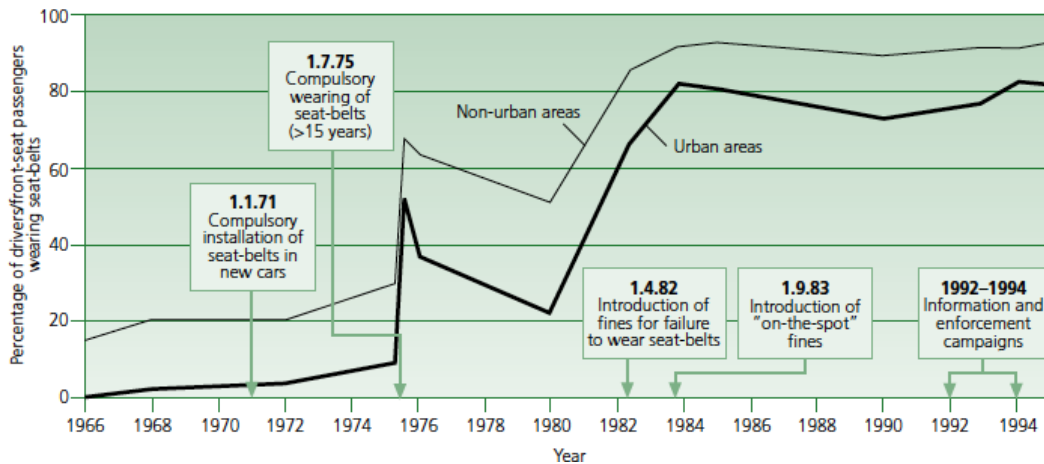
Fourthly, enforcement quickly emerged as the key driver of behaviour.

In South Australia, for instance, seat belt use reached an initial high of 78 percent in 1973 but weak enforcement saw it drift down to 70 percent by 1975. After a twelve-week blitz that fined 6,000 drivers, the rate of seat belt wearing leapt to 90 percent in the following year.<sup>4</sup>

This graph from a Finnish study neatly shows the importance of enforcement as a behavioural tool.

FIGURE 4.1

Use of seat-belts by car drivers/front-seat passengers in urban and non-urban areas of Finland, 1966–1995



The impact of enforcement. Source: *Seat-belts and child restraints: increasing use and optimising performance*, Brussels, European Transport Safety Council, 1996.

An unusual feature of many US state laws provides valuable evidence for the power of enforcement. Initially many US seat belt laws only allowed secondary enforcement. That is, motorists could only be issued a seat belt citation after they'd been stopped for some other reason. By comparison, primary enforcement laws allowed a police officer to stop and cite a motorist solely for not using a seat belt.

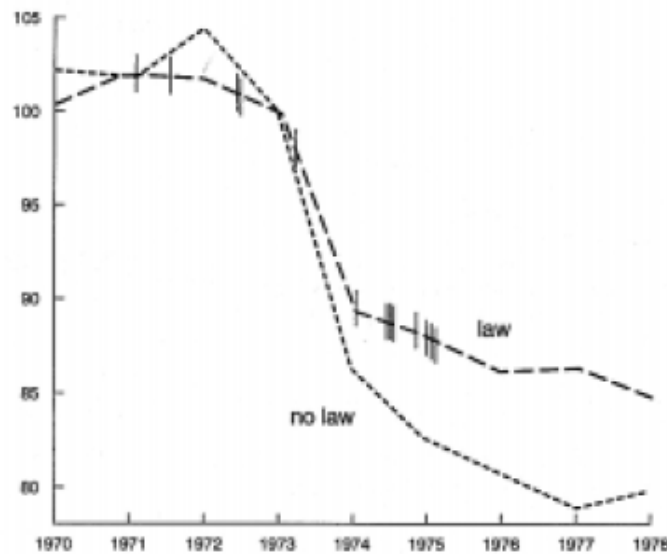
When secondary enforcement states adopted primary enforcement the result was invariably a big shift in compliance. California's 1993 shift from secondary to primary enforcement saw seat belt use jump 58 percent to 76 percent.<sup>5</sup> Mississippi's 2006 shift saw a leap from 61 percent to 74 percent.<sup>6</sup> On average 85 percent of Americans now buckle-up in states with primary enforcement laws while only 74 percent do in states with secondary enforcement.<sup>7</sup> There's evidence that the shift to primary enforcement also saved lives. One study showed that seat belt laws reduced fatalities by 9.9 percent in states with primary enforcement laws but only a 6.8 percent decline in states with secondary enforcement.<sup>8</sup> Another estimated a 7 percent difference between the two regimes,<sup>9</sup> amounting to 696 deaths per year in the 10 states studied.<sup>9</sup>

Mandatory seat belt laws seem to demonstrate how a mix of technological change, social leadership, education and enforcement can alter the behaviour of whole populations.

## Contrary evidence emerges

Then along came John Adams, Professor of Geography at University College London, to rain on everyone's parade.

In a 1981 paper he compared death and injury rates in states with and without seat belt laws and noticed something odd, as you can see in the figure below.



It's wasn't supposed to be like this. Death rates in thirteen seat belt law countries, compared to four non-law countries. Source: Adams, J. (1986) <sup>10</sup>

In the eighteen countries he surveyed, accounting for about 80 percent of the world's motoring, those with seat belt laws fared no better, and in some cases (e.g. Sweden, Ireland and New Zealand) *worse* than those without laws. Adams' data suggested that seat belt laws were counter-productive, increasing fatalities rather than reducing them. Perhaps, Adams speculated, the global oil crisis and the economic "stagflation" of the mid 1970s had been responsible for fewer accidents, not the seat belt laws.

Adams' paper appeared at a precarious moment for the UK's seat belt advocates. Parliament was about to debate a mandatory seat belt bill. No doubt in a prickly mood, Britain's Department of Transport quickly commissioned an internal critique of Adam's work. To their horror, the critique agreed with Adams. It concluded: "Available data for eight western European countries which introduced a seat belt law between 1973 and 1976 suggests that it has not led to a detectable change in road deaths..."<sup>11</sup> Significantly, the internal paper also noted that pedestrian deaths had *increased*

slightly in the eight countries since their seat belt laws were passed. The Department suppressed the critique until Parliament passed the law and Adams' research was denounced by a succession of MPs as "spurious", "eccentric", "preposterous" and "bogus". The UK bill became law.

Adams' observation has remained a thorn in the side of seat belt advocates to this day. Proving or disproving the benefits of seat belt laws has since become a minor industry for statisticians.

For example:

A 2000 study for the Automobile Insurers Bureau of Massachusetts analysed 15 years of state by state data and concluded that the effect of seat belt laws "was low, at most, each increase of 1 percent in the occupant safety belt use in a given state is associated with 1.15 fewer deaths."<sup>12</sup>

Harvard economists Alma Cohen and Liran Einav crunched the data again in 2001 and found that early studies had overestimated the death and injury reductions from seat belt laws by a factor of two.<sup>13</sup>

In 2002 Brendan McGuire and colleagues at Western Illinois University re-crunched the data and concluding that "For several years traffic fatality rates have been declining in roughly equal proportions in both law states and non-law states...while seat belt legislation is positively associated with increased safety belt use, neither seat belt laws nor seat belt use rates are associated in any substantial way with traffic death rates."<sup>14</sup>

There are also a number of research studies to the contrary, so, in fact (and amazingly) the jury is still out on whether seat belt laws have really saved lives. Perhaps a conservative position is that mandatory seat belts *may* have saved lives but at nothing like the levels claimed by the traffic authorities.

### **Possible causes of the ineffectiveness of seat belt laws**

So what is the explanation? Surely seat belts prevent injury. I for one vastly prefer the idea of being restrained in a padded seat during a collision rather than rattling around inside a rapidly decelerating steel box. Even the skeptical Professor Adams agreed with an authoritative estimate that, *if one is in crash*, the chance of survival increases by 41 percent if one is restrained by a seatbelt.

It seems that two psychological effects may be at work: risk compensation and resistance.

Adams proposed risk compensation as the cause of apparent ineffectiveness of seat belt laws. Risk compensation is a well established concept in psychology.<sup>15</sup> The idea is that people get used to, enjoy, and need a certain degree of risk in their lives. If that level is reduced, they compensate by increasing their risks in other ways.

So, buckled-up drivers feel safer and, to compensate for that reduced risk, are likely to drive more dangerously, causing more frequent and more violent accidents that increase the risk to other drivers, bicyclists, pedestrians and their own unbuckled passengers.

This claim set off a new cycle of research amongst statisticians and psychologists.

Some of this research supported the existence of a risk compensation effect.<sup>16 17</sup> For example, a study for the New Jersey Office of Highway Traffic Safety concluded that "The main findings are that injury severity declined significantly in the 22 months following implementation of the [seat belt law]; but that accident frequency increased significantly...the real safety effect of the law may have been diluted by risk-compensating behavior."<sup>18</sup>

Other studies have produced equally convincing evidence against the existence of a risk compensation effect<sup>19 20</sup> however it remains a strong contender for an explanation of the failure of seat belt laws to produce their predicted effects.

The second explanation involves resistance.

Considering it's ubiquity and potency, resistance is a seriously under-theorised aspect of human psychology, little advanced since the work of the Brehms in the 1960s. They coined the term "psychological reactance" for the motivation people experience when they feel a customary freedom is threatened.<sup>21</sup> As a result people tend to assert that freedom with more vehemence and enjoyment than before. Freedom, of course, includes the freedom not to wear a seat belt, and resistance to mandatory seat belt laws would therefore take the form of unbuckling more frequently and consistently than in the absence of those laws. More generally, it could take the form of increased risk taking behind the wheel.

Significantly, not everyone is likely to resist a new law. Resistors are those whose identity is most strongly tied to the threatened freedom. In the case of seat belt laws, resistors would be those who are already habitually dangerous drivers.

In Victoria, for instance, only 3 percent of drivers don't regularly wear seatbelts, but they're involved in 33 percent of fatal crashes (and 58% are drunk at the time!)<sup>22</sup>

A 1990 study in North Carolina (where seat belt use was then 80 percent) found the remaining 20% tended to be male, under 35 years old, driving older vehicles, preferring pickups, having poor driving records, being less likely to have health care coverage, more likely to have consumed large amounts of alcohol in the past year, and more likely to have an arrest record.<sup>23</sup> Another study found non-users in North Carolina had 35 percent more accidents and 69 percent more violations than users.<sup>24</sup>

"Belt use among those most likely to be involved in traffic accidents (e.g. males, drinkers of alcohol, the young) has been significantly less responsive to seat belt laws and their enforcement," concluded economist Thomas Dee after analysing US national survey data.<sup>25</sup>

Others researchers agree: "we believe that recent increases in safety belt usage may not be primarily responsible for the observed decrease in road fatalities. The population safety belt usage increase may be due to risk averse "good" drivers and their children occupants increasing their usage rate while risky "bad" drivers and their children occupants maintain their current behaviour."<sup>26</sup>

So, although most people buckle up, it seems a small minority of unbuckled drivers are causing a wildly disproportionate amount of damage.

No one seems to have emphasised this point, but a straightforward application of the principle of psychological reactance suggests that these habitual risk-takers are likely to *increase* their risk taking due to the existence of mandatory seat belt laws. Their freedom to enjoy risky driving is threatened by the laws, so their motivation to take those risks would be increased.

As a possible local example of this effect, when Western Australian Premier recently increased the first offence for driving without a seat belt from \$150 to \$500 the number of unrestrained deaths increased from 41 (28% of vehicle occupant fatalities) to 63 (36% of vehicle occupant fatalities).<sup>27</sup> This would be perfectly consistent with a resistance effect.

## Conclusion

Thanks to statisticians and psychologists, the once sparkling image of mandatory seat belt laws has become a lot murkier than we hoped. Two aspects of human nature, risk compensation and resistance, seem to have fundamentally diluted the expected impact of these laws.

The case of mandatory seat belt laws demonstrates that even when laws have overwhelming public support and are backed by continuous education and aggressive enforcement, there are aspects of human nature that can negate many of their hoped-for benefits.

The reasons are that those who do comply tend to compensate by adopting other risky behaviours. Meanwhile the very people who most need to change their behaviour may be behaving worse in the presence of the laws. This "blow back" was not predicted by authorities.

The history of alcohol and drug prohibition and many other attempts to use criminal law to regulate behaviour demonstrate similar pitfalls.

Nevertheless, legislatures remain ever ready to criminalise behaviours they deem to be harmful. Recent examples include banning Islamic headgear (France), criminalising overseas surrogacy (Australian states), and anti-social behaviour orders (UK).

## Lessons

What lessons can be drawn from the history of seat belt laws?

- 1) If you can avoid using criminalisation as a tactic, do so. Criminalisation causes resistance and unexpected blow-backs can fundamentally undermine your efforts.
- 2) Ensure you have a believable, science-based, clearly articulated case, supported by respected, independent voices.
- 3) Don't consider criminalisation *until* you have overwhelming support and a high degree of voluntary compliance in the target population. In effect, criminalisation should only be considered when it reinforces existing social norms. Criminalisation may therefore be useful at the *end* of a long process of voluntary change to control the behaviour of a very small number of chronic resistors.



4) There will always be a small number of resistors and they are likely cause a disproportionate amount of harm. Therefore understand that criminalisation requires a significant, endless investment in monitoring and enforcement. Weakness in this area is likely to fundamentally undermine the impact of legislation.<sup>28</sup>

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<sup>2</sup> National acc Traffic Safety Administration, *Traffic Safety Facts* April 2007 <http://www-nrd.nhtsa.dot.gov/Pubs/810690.pdf>, accessed 19 March 2008

<sup>3</sup> Milne, P.W. (1985) p5

<sup>4</sup> Milne, P.W. (1985) pp12

<sup>5</sup> Beck L.F. et al. (2007) Associations Between Sociodemographics and Safety Belt Use in States With and Without Primary Enforcement Laws, *American Journal of Public Health* Vol 97(9) pp1619-1624

<sup>6</sup> National Highway Traffic Safety Administration, *Traffic Safety Facts* April 2007

<http://www-nrd.nhtsa.dot.gov/Pubs/810690.pdf>, accessed 19 March 2008

<sup>7</sup> Beck L.F. et al. (2007)

<sup>8</sup> Wagenaar, A.C., Maybee R.G., and Sullivan, K.P. (1988) Mandatory seat belt laws in eight states: a time-series evaluation, *Journal of Safety Research* Vol 19(2) pp51-70

<sup>9</sup> Charles M. Farmer, C.M. and Williams, A.F. (2004) Effect on Fatality Risk of Changing from Secondary to Primary Seat Belt Enforcement, Insurance Institute for Highway Safety, downloaded from

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<sup>11</sup> Quoted in Adams, J. (1986) p10

<sup>12</sup> Derrig. R.A., Segui-Gomez, M.D. and Abtahi, A. (2000) The Effect of Seat Belt usage Rates on the Number of Motor Vehicle-Related Fatalities, Proceedings of the Risk Theory Society, downloaded from

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<sup>13</sup> Cohen, A., Liran, E. (2001) The Effects of Mandatory Seat Belt Laws on Driving Behavior and Traffic Fatalities,

[http://www.law.harvard.edu/programs/olin\\_center/papers/pdf/341.pdf](http://www.law.harvard.edu/programs/olin_center/papers/pdf/341.pdf) accessed 18 March 2008

<sup>14</sup> Maguire, B., Faulkner, W.R. and Mathers R.A. (2002) Seat belt laws and traffic fatalities: A research update, *Social Science Journal* Vol 33(3)

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pp321-333

<sup>15</sup> For a summary, see [http://en.wikipedia.org/wiki/Risk\\_compensation](http://en.wikipedia.org/wiki/Risk_compensation)

<sup>16</sup> Evans, W.N. and Graham, J.D. (1991) Risk reduction or risk compensation, *Journal of Risk and Uncertainty* Vol 4(1) pp61-73

<sup>17</sup> Asch, P. et al (1991) Risk compensation and the effectiveness of safety belt use laws: a case study of New Jersey, *Policy Sciences* Vol 24(2) pp181-197

<sup>18</sup> Asch, P. et al (1991), abstract

<sup>19</sup> Houston, D.J. and Richardson, L.E. (2007) Risk Compensation or Risk Reduction? Seatbelts, State Laws, and Traffic Fatalities, *Social Science Quarterly* Vol 88(4) pp913-936

<sup>20</sup> Cohen, A., Liran, E. (2001) The Effects of Mandatory Seat Belt Laws on Driving Behavior and Traffic Fatalities  
[http://www.law.harvard.edu/programs/olin\\_center/papers/pdf/341.pdf](http://www.law.harvard.edu/programs/olin_center/papers/pdf/341.pdf) accessed 18 March 2008

<sup>21</sup> For a summary, see [http://en.wikipedia.org/wiki/Reactance\\_\(psychology\)](http://en.wikipedia.org/wiki/Reactance_(psychology))

<sup>22</sup> Transport Accident Commission statistics, 2008,  
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<sup>23</sup> Reinfurt, D. et al (1990) Characteristics of drivers not using seat belts in a high belt use state, *Journal of Safety Research* Vol 27(4) pp209-215

<sup>24</sup> Hunter W.W. et al (2002) Characteristics of seat belt users and non-users in a state with a mandatory belt use law, *Health Education Research* Vol 5(2) pp161-173

<sup>25</sup> Dee, T.S. (1996) Reconsidering the effects of seat belt laws and their enforcement status, *Accident Analysis and Prevention* Vol 30(1) pp1-10

<sup>26</sup> Derrig et al (2000)

<sup>27</sup> Source: Pers Comm, WA Government informant 2009.

<sup>28</sup> For example, the poor compliance and high resistance to native vegetation clearance laws has been explained by the great difficulty of monitoring and the paucity of prosecutions. See:

<http://www.aic.gov.au/publications/current%20series/rpp/100-120/rpp109/09.aspx>