Neo-Political Action and a New Public Policy Paradigm

Neo-Political Action and a New Public Policy Paradigm –
A case study of mandatory bicycle helmet laws

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Abstract:

Ever since their introduction in the early 1990s, Australia’s mandatory helmet laws have been the subject of controversy and debate.

Helmet proponents argue that the protection of the cyclist's head from injury is the primary issue in the debate. However, there is disagreement about the extent to which helmets do actually provide protection given the diversity of head injuries sustained by cyclists.

Conversely, the extent to which having to wear a helmet acts as a disincentive to potential cyclists and, hence, reduces the economic, environmental, health and social benefits of cycling is often overlooked due to political sensitivity. However, in recent years this aspect has been gaining prominence due to the national increase in obesity, heart and other diseases resulting from low levels of physical activity.

This paper outlines the experience of a group of volunteer professionals in Western Australia independently advocating for a comprehensive review of bicycle helmet laws. This group represents a new paradigm of active public participation in the Local, State and National political spheres. A perceived lack of action on controversial and sensitive political issues (such as bicycle helmet laws) is causing a shift of democracy toward independently organized action groups.

This presentation shows how independent community action can create a substantial and arguable policy position, including national coordination between aligned active community groups using contemporary communication methods and undertaking research that should have been undertaken by governments.

This presentation is designed to begin the discussion of a blueprint of a new democratic action paradigm that will enable small groups to gain significant traction in the socio-political arena, along with outlining the findings of the review. The outcomes of the volunteer professional groups research into bicycle helmet law will be presented to highlight the challenges of this new paradigm and how they can be overcome to create meaningful change in the community.
Introduction

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Conversely, the extent to which having to wear a helmet acts as a disincentive to potential cyclists and, hence, reduces the economic, environmental, health and social benefits of cycling is often overlooked due to political sensitivity. However, in recent years this aspect has been gaining prominence due to the national increase in obesity, heart and other diseases resulting from low levels of physical activity.

This paper outlines the experience of a group of volunteer professionals in Western Australia independently advocating for a comprehensive review of bicycle helmet laws. This group represents a new paradigm of active public participation in the Local, State and National political spheres. A perceived lack of action on controversial and sensitive political issues (such as bicycle helmet laws) is causing a shift of democracy toward independently organized action groups.

Need for a New Policy Paradigm

Policy Analysis Is Not Always Rational

There are many reasons why policy and action might not be rational (Brafman and Brafman, 2008). One of the key ways is what psychologists call a bias – a way in which we systematically get things wrong, ways in which we miscalculate, misjudge or distort reality or see what we want to see. In the case of cycle helmets, we potentially have a version of what might be called the insurance bias – accepting an ongoing loss (health and fitness; traffic congestion; air pollution) we believe is small to avoid the possibility of a much larger loss (severe head injury or death), even though, collectively, the ongoing losses exceed the avoided ones.

From an individual perspective, it is a perfectly rational decision to decide to wear a helmet, as that voluntary decision reduces one’s risk of head injury while cycling but does not, of itself, mean that we cycle any less. There is no ‘ongoing loss’ other than a small financial cost (of a helmet) and a small loss of convenience.

From a collective viewpoint, however, it is only rational to force all cyclists to wear helmets if there is little or no impact on their willingness to cycle. This seems unlikely, as the requirement to wear a helmet strengthens the pre-existing perception that cycling is a dangerous activity.

These biases seem to be highly prevalent in issues relating to road safety, where anecdotal evidence based on single examples can be used to great emotional effect. It is much more powerful to present the person whose life was ‘saved [really means ‘extended’] by wearing a helmet’ (often a contention that cannot be proved) than to present the much larger number whose lives were improved and extended by increased physical activity through cycling.

Levitt and Dubner (2010) describe the difficulty they had in getting child car seats tested against a standard lap/sash seat belt for children. Only one crash-test laboratory was willing to undertake the tests – and then only on the basis of anonymity, as the owner was concerned at the possible loss of work from the car-seat manufacturers who were the core of his business. The actual engineer initially refused to run the tests on the grounds that it was ‘an idiotic experiment’ – of course the car seats would perform better. In fact, the results showed that the standard seat belts exceeded every requirement for how a child safety seat should perform.
In the case of helmet laws in Australia, the political climate is such that cycling policy studies shy away from considering mandatory helmet laws as a barrier to cycling, lest the rest of the issues addressed lose credibility (see, eg, Baumann et al, 2008).

In other areas, too, policy seems to be less and less likely to be the product of debate and analysis, which leads to community disempowerment. A perceived lack of action on these controversial and sensitive political issues is causing a shift of democracy toward independently organized action groups, but these groups run the risk of another basis for irrationality – value attribution, which is the inclination to imbue a person or thing with certain qualities based on an initial perceived value (Brafman and Brafman, 2008). Thus, a call for an objective assessment of mandatory helmet laws is likely to be perceived as sectoral and self-interested if it comes from a cycling group only. We hope that the broad authorship of this paper at least helps protect us from negative value attribution.

Helmet Laws in Australia

A Brief Assessment History

Although there had been programs to encourage cyclists to wear helmets, including payment of subsidies through schools, mandatory helmet laws were introduced without any consultation or published analysis. The states and territories were simply told by the Federal Minister of Transport to introduce laws or lose black-spot (road safety) funding.

Since the laws were introduced in all jurisdictions at the beginning of the 1990s, there has been limited formal analysis of effects of mandatory helmets, most during the initial five years or so.

- Carr et al (1995) found that “the first four years of the legislation has seen a (statistically reliable) 39.5% reduction in the number of head-injured admissions across Victoria. It noted (but did not investigate) that it was “possible that a part of the change relates to the reduced exposure to crash risk of bicyclists since the legislation’s introduction”, an explanation that is almost essential to explain the simultaneous reduction in non-head –injured cyclists admitted to hospital (Figure 1).

- Robinson D (1996) observed from this data that non-head-injury admissions outnumbered those for head injury by a factor of approximately 2:1 both before and after the law.

Figure 1  Monthly cyclist hospital admissions, Victoria – head-injured and non-head-injured

- Robinson D (1996) also used New South Wales data to observe that “head injuries to child cyclists declined by only 29% in years 1 and 2 [after legislation] compared with reductions of 36% and 44% in numbers of child cyclists” and concluded that “if the [usage] surveys were representative of the effect of the law on cycling participation, then the risk of head injury would appear to have increased, rather than decreased”. 
• Bruce Robinson (1996) argued for a comprehensive review of the laws but noted the need for better data. He also noted that, in WA as in Victoria, there was no discernable effect of the laws on the proportion of cyclist admissions to hospital that involved a head injury (Figure 2). Not only is it, as he stated, not possible to discern from the graph the year of introduction of the helmet laws, but if one were to attempt to do so the ‘most likely’ year would be 1987, not 1990-92.

**Figure 2  Annual cyclist hospital admissions, Western Australia – proportion head injured**

![Graph showing proportion of hospitalised cyclists with head injuries, WA Health Department morbidity database.](source)

• Dorothy Robinson (2006) notes similar trends for head injuries to both cyclists and pedestrians in a number of Australian and international jurisdictions – whether there were helmet laws or not. In New Zealand, “most primary school children were already wearing helmets before the law, but helmet wearing among adults increased from 43% to 92% after the law was enacted. If helmet laws were effective, the percentage of adults with head injuries should have fallen substantially more than the percentage of primary school children, but it did not” (Figure 3).

**Figure 3  Percentage of cyclists wearing helmets and percentage of head injuries in accidents not involving motor vehicles among primary school children and adults in New Zealand**

![Graph showing percentage of cyclists wearing helmets and head injuries, New Zealand](source)

• Hendrie et al 1999 studied both the effectiveness of the bicycle helmet legislation in reducing head injuries to cyclists in Western Australia and the cost-effectiveness in terms of its costs and outcomes, but specifically excluded the possible impact on cycling activity and associated changes in physical fitness and related health conditions. They found reductions in the number of cyclists with head injury, but only half the reduction (11%-21%, compared to 39.5%) found in Victoria by Carr et al (1995).

They also present data showing a flattening of the pre-existing trend of lower head injuries relative to other injuries, which strongly suggests that something was driving down both head injuries and other injuries among the population as a whole (Figure 4).
• Haworth et al (2010) concluded that “Current bicycle helmet wearing rates are halving the number of head injuries experienced by Queensland cyclists”, but failed adequately to consider the extent to which this has been due to a reduction in the amount of cycling (see ‘Does Mandatory Helmet-Wearing Reduce Cycling?’, below).
The report claims to include “reviews of the national and international literature regarding the health outcomes of cycling and bicycle helmets”, but only mentions Carr et al (1995) of the above studies.
Assessments of the effectiveness of helmets often fail to address the cost (including the costs of purchasing helmets) and also the pre-existing trends towards fewer head injuries among cyclists. Haworth et al (2010) cite 1995 New Zealand research to argue that the laws were cost-effective, but fail to mention Western Australian research (Hendrie et al, 1999) that estimated the net present value of the helmet laws to be between $2 million and minus $10.6 million – even without considering any negative effects on cycle usage.

Attitudes Towards Review of Helmet Laws
There appears to be a strong aversion in government to any suggestion of reviewing mandatory helmet laws for cyclists. The response from officers in the WA Department of Transport was that such a review would not be supported (even before knowing what the basis for such a review would be) – which, of course, cuts off any official avenue for initiating such a review. The basis for this response was said to be that such a review had already been carried out (Haworth et al, 2010), with no acknowledgement that this was specifically for Queensland and might, itself, have deficiencies that should be contested.
Since the Haworth et al (2010) review, a Queensland Parliamentary inquiry into bicycle safety has recommended changes to helmet laws (Queensland, 2013), including:

…that the Minister for Transport and Main Roads:

• introduce a 24 month trial which exempts cyclists aged 16 years and over from the mandatory helmet road rule when riding in parks, on footpaths and shared/cycle paths and on roads with a speed limit of 60 km/hr or less; and

• develop an evaluation strategy for the trial which includes baseline measurements and data collection (for example through the CityCycle Scheme) so that an assessment can be made which measures the effect and proves any benefits. [Recommendation 15]
However, on the very day of the report’s release, the Queensland Minister for Transport stated that he opposed the committee’s suggestion (recommendation 15) to remove the need for helmets in 60kph and less speed zones and on bike paths. “I’ve put a lot of thought into this issue since it was first raised six months ago and I’m yet to be convinced of its merit,” he said. “Personally I’m a big believer in the benefits of helmets and I believe the evidence shows helmets reduce the risk of serious injury.”

The Minister clearly has a different view of the evidence from the Parliamentary Committee and has chosen to avoid the possibility of being proven wrong. It is clear from his statement that he doesn’t appreciate the distinction between individual safety and population health.

All attempts to assess the effects of helmet laws have had to contend with the paucity of data on both cycle injuries and, in particular, cycle usage (Ker, 2011). This introduces the very real danger of mistaking ‘absence of evidence’ for ‘evidence of absence’, which is precisely what Haworth et al (2010) do in respect of the effect of helmet laws on cycle usage.

Policy Analysis Framework

Formal analysis of cycle helmets in Australia has very much focused on the intrinsic value of helmets in reducing the incidence and severity of head injuries among cyclists. However, there are at least five questions that a rigorous assessment of mandatory helmets needs to address (Figure 5):

- How effective are helmets in reducing head injury – and are there other intrinsic health effects, such as increased heat stress and risk of skin cancer?
- Do helmets provide a false sense of security, encouraging less-safe cycling behaviours or a related effect amongst car drivers?
- Have mandatory helmet laws reduced the amount of cycle usage in Australia – and, if so, what are the economic, social, environmental and health effects of such a reduction?
- Does any reduction in cycle usage make cycling less safe for remaining cyclists – the converse of the ‘safety-in-numbers’ effect?
- Are any negative effects reversible? If so, can they be reversed without losing the positive effects?

Figure 5 Policy benefit analysis framework for mandatory helmet laws

Analysis of helmet laws, itself, sits within a much larger framework of factors affecting cycle safety and usage, including the classic 4-Es of bicycle planning: Engineering, Encouragement, Education and Enforcement.
There has, until recently, been doubt about the ability to demonstrate the economic, social and environmental value of cycling programs in ways comparable to those used for other modes of transport, but this is no longer the case (Ker, 2014).

**Helmets and Safety: Head Injury**

Thompson et al (2009) conclude on the basis of a Cochrane Collaboration\(^1\) meta-analysis that:

- Helmets provide a 63% to 88% reduction in the risk of head, brain and severe brain injury for all ages of bicyclists.
- Helmets provide equal levels of protection for crashes involving motor vehicles (69%) and crashes from all other causes (68%).
- Injuries to the upper and mid facial areas are reduced by 65%.

Haworth et al (2010) concluded that “bicycle helmets that meet national standards protect against head, brain, and facial injuries. Helmet wearing was associated with a 69% reduction in the likelihood of head or brain injury and a 74% reduction in the likelihood of severe brain injury. The benefit was the same whether a motor vehicle was involved in the crash or not. Helmet wearing reduced the likelihood of injury to the upper and mid-face by 65%”.

A UK review (Hynd et al, 2009) concluded that “…in the event of an on-road accident, cycle helmets would be expected to be effective in a range of real-world accident conditions, particularly the most common accidents that do not involve a collision with another vehicle and are often believed to consist of simple falls or tumbles over the handlebars” [emphasis added by current authors].

It is not the intention of this paper to argue with these specific conclusions or the similar work of others, but it should be noted that such conclusions are based on studies that considered the difference between helmet users and non-users among cyclists. They did not consider whether there had been any effect on cycling participation and, hence the broader health, economic, social and environmental effects.

Rissel and Wen (2011) cite research that shows that some of these studies were influenced by publication bias\(^2\) and time-trend bias that was not controlled for and, as a result, produced inflated estimates of the effectiveness of bicycle helmets” [footnote added by current authors].

In addition, Hynd et al (2009) specifically state that their review did “not include detailed consideration of whether wearing (or not wearing) a helmet influences the likelihood of being involved in an accident, either through behaviour changes in the rider or in other road users” (see ‘Risk Compensation’, below).

Moreover, Hynd et al (2009, p vi) found that “Of the on-road serious cyclist casualties admitted to hospital in England:

- 10% suffered injuries of a type and to a part of the head that a cycle helmet may have mitigated or prevented; and

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\(^1\) Cochrane Collaboration Reviews are systematic reviews of primary research in human health care and health policy, and are internationally recognised as the highest standard in evidence-based health care. Each systematic review addresses a clearly formulated question; for example: Can antibiotics help in alleviating the symptoms of a sore throat? All the existing primary research on a topic that meets certain criteria is searched for and collated, and then assessed using stringent guidelines, to establish whether or not there is conclusive evidence about a specific treatment. [http://www.cochrane.org/cochrane-reviews](http://www.cochrane.org/cochrane-reviews)

\(^2\) Publication bias results from the greater likelihood of publication of studies with significant, positive, results. Such studies are easier to find than those with non-significant or 'negative' results. The subsequent over-representation of positive studies in systematic reviews may mean that reviews are biased toward a positive result. [http://www.cochrane-net.org/openlearning/html/mod15-2.htm](http://www.cochrane-net.org/openlearning/html/mod15-2.htm) Two of the five head injury studies and two of the three facial injury studies were undertaken by one or more of the authors of the Cochrane Review (Thompson et al, 2009).
• 20% suffered ‘open wounds to the head’, some of which are likely to have been to a part of the head that a cycle helmet may have mitigated or prevented.” [Emphasis added by current authors.]

Put another way, more than 70% of on-road cyclists admitted to hospital had injuries that would not have been mitigated or prevented by a helmet and more than 90% did not have impact injuries that would have been mitigated or prevented by a helmet.

Helmets and Health

The health benefits of cycling are attracting increasing attention, largely in response to community-wide lower levels of physical activity and the corresponding increase in obesity and related diseases. A recent evaluation of cycling infrastructure programs in Western Australia, for example, reported health benefits (net of any increase in road trauma) to be 20% of total benefits (Ker, 2012).

De Jong (2012) used a simple model, with a single health benefit (reduced head injuries) and a single health cost (increased morbidity due to foregone exercise from cycling) to conclude: “In jurisdictions where cycling is safe, a helmet law is likely to have a large unintended negative health impact. In jurisdiction [sic] where cycling is relatively unsafe, helmets will do little to make it safer and a helmet law, under relatively extreme assumptions may make a small positive contribution to net societal health.”

A key issue here is the extent to which reduction in cycling is compensated for by increases in other physical activity – about which there is very little evidence. The overall evidence on physical activity and its continuing decline over an extended period (see, eg, Government of WA, 2011), can be seen either as suggestive of a pre-existing trend or that physical activity, once given up, is unlikely to be replaced by another form of physical activity. Some forms of cycling (such as commuting or riding to school) are more easily incorporated into daily routines than potential replacement physical activities that are more recreational.

It is also pertinent (although unfortunately rare) to ask whether there are other intrinsic health effects, such as increased heat stress and risk of skin cancer.

• **Heat stress.** Fatigue is a major cause of vehicle road accidents. Riding a bicycle requires physical exertion and cyclists can get very hot at times and the head represents a large portion of the cooling surface for a cyclist. Wearing a helmet reduces the ability to keep cool, sweat produced is unable to evaporate and provide normal cooling. To compensate the body produces even more sweat attempting to try to keep cool, potentially increasing fatigue, dehydration and heat stroke. If not treated or handled properly, heat stroke can cause shock, heart or organ failure leading to death can follow. ([http://bicycleaustralia.org/helmets.php](http://bicycleaustralia.org/helmets.php))

• **Skin Cancer.** In 2009 there were 1147 admissions to WA hospitals where the external cause was a bicycle accident (of which only a proportion would have involved head injuries that a helmet might reduce or ameliorate), whereas there were 11286 admissions for patients diagnosed with a skin cancer ([http://btawa.org.au/campaigns/helmets](http://btawa.org.au/campaigns/helmets)). The difficulty of wearing both a brimmed hat and a helmet together increases the skin cancer risk for cyclists.

Helmets and Behaviour: Risk Compensation

Risk compensation occurs if people react to a safety law or regulation by acting less safely. Hedlund (2000) concludes that risk compensation can occur in certain circumstances. Adams and Hillman (2001) argue that cycle helmets meet key criteria identified by Hedlund for risk compensation to occur.

There are two elements to possible risk-compensation with mandatory helmet laws:

• **Greater risk-taking by cyclists.** Some of the debate on this has been criticised as being non-evidence-based:

  “They [Adams and Hillman 2001] disagree, however, with our conclusion that the use of helmets should therefore be encouraged based on our differing views of the evidence for risk
compensation. They claim there is solid evidence for this hypothesis. We believe there is not and that we will only know this once a systematic review of risk compensation is conducted. Instead of being scientific, their arguments are based mainly on theory, philosophy, or expert opinion” (Thompson et al, 2001).

However, a more recent study of cyclists has concluded that “those who use helmets routinely perceive reduced risk when wearing a helmet, and compensate by cycling faster. [The findings] thus give some support to those urging caution in the use of helmet laws” (Phillips et al, 2011).

- **Greater risk-taking by motorists** – motor vehicle drivers being less wary around a ‘protected’ cyclist. Walker (2006) found “overtaking motorists pass closer to a bicyclist when the rider wears a helmet…” and suggests, on the basis of previous research, that this may be “the result of motorists making assumptions about bicyclists’ behaviours based on a brief visual assessment of their likely experience levels”. Whilst wearing a helmet is likely to be an indicator of greater experience in an unconstrained context, it is clearly less reliable where all cyclists are required, by law, to wear helmets.

A similar concept of risk compensation is also to be found in road design manuals (York, et al, 2007, p54), which cites Scottish guidance as follows:

“All of the most important variables that needs to be taken into consideration is ‘risk homeostasis’ – the way in which drivers adjust their behaviour to maintain a consistent level of risk. As drivers feel safer they begin to take more risks, whereas conversely, if road conditions make them feel unsafe, drivers are likely to adjust their behaviour to take fewer risks.”

### Does Mandatory Helmet-Wearing Reduce Cycling?

Macpherson and Spinks (2010) found that bicycle helmet legislation appeared to be effective in increasing helmet use and decreasing head injury rates amongst cyclists, but that there were very few high quality evaluative studies that measured these outcomes, and none that reported data on possible declines in bicycle use.

A Norwegian study (Fyrhi et al, 2012) concluded that “at least part of the reason why helmet laws do not appear to be beneficial is that they disproportionately discourage the safest cyclists.”

Haworth et al (2010, p23) state that “there is mixed evidence regarding the effect of mandatory helmet use for children on cycling participation in international studies. Having said that, however, they go on to conclude: “It is reasonably clear that it [the mandatory helmet law] discouraged people from cycling twenty years ago when it was first introduced. …there is little evidence that it continues to discourage cycling. There is little evidence that there is a large body of people who would take up cycling if the legislation was changed.

Here, they are clearly interpreting absence of evidence (data on cycling activity, especially around that time, is notoriously poor (Ker, 1994)) as evidence of absence. We present data for Western Australia in this paper that support the view that cycling helmet laws continue to discourage people from cycling.

Haworth et al (2010) correctly note that there are many other factors that are barriers to cycling “including weather, distance, perceived levels of safety and other psychological factors”, but fail to acknowledge that mandatory helmet laws are, themselves, likely to have enhanced perception of cycling as an unsafe activity.

### Measures of Cycle Usage

Data on cycle usage in Australia (and other places where compulsory helmet laws have been introduced) tend to be sporadic and measure only a part of cycling activity – and often do not extend back far enough to show the situation and trends before and after those laws were introduced. However, there appears to be substantial evidence that cycle usage did fall, across Australia,
immediately after the laws were introduced (http://www.cycle-helmets.com) and that some partial (ie not comprehensive) measures of cycle activity have shown substantial subsequent growth.

Looking specifically at Perth, Western Australia, there was a substantial decline in the rate of growth of cycling between 1989 and 1994 (Figure 6). The timing of this suggests that one or more events in the early 1990s caused a one-off reduction in the level of activity and/or an ongoing reduction in the rate of growth of cycling.

Change in cycle usage has not been uniform across the cycling network in the Perth Metropolitan Area. Since the mid-1990s, there has been continuing and rapid growth in the usage of key, inner urban parts of the Perth Bicycle Network (Painted Dog Research, 2013), much of this for commuting or recreational purposes. This contrasts with the overall measures of cycle activity for the Perth Metropolitan Area such as:

- The Census journey to work data, which show cycling mode share dropped by nearly 40% between 1991 and 1996 and had not recovered to 1991 levels in 2011 (Figure 7); and
- Perth Area Travel Surveys (PARTS), which show the bicycle mode share of all trips to have fallen from 5.2% in 1986 to 1.7% in 2006 (Figure 8).

Sources:


1986 data from tabulations provided by Transport WA in the early 1990s.

2003-6 data from PARTS (undated) and more detailed tabulations provided by Peter Lawrence (Department of Planning) in personal communications.

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Some concern has been expressed that PARTS might have under-recorded short trips in 2006, but the maintenance of the level of walk trips, which are generally the shortest of all, suggests that the explanation for the collapse of cycling trips must be sought elsewhere (Ker, 2011).
The Census and PARTS are, at least in principle, consistent, because work trips have become a much larger proportion of a much smaller amount of bicycle activity (Ker, 2011). The reduction in cycling activity has been almost entirely in shopping and school travel (Figure 9).

Moreover, the continuing observed increase in inner urban commuting and recreational cycling implies an even greater reduction in cycling in middle and outer areas and for other trip purposes, especially those that because of their short length and location (local rather than arterial roads) are likely to be lower-risk. This is consistent with the conclusion that helmet laws disproportionately discourage the safest cyclists (Fyrhi et al, 2012).

**Figure 9  Cycle trip purposes, Perth: 1986 and 2006**

![Cycle trip purposes, Perth: 1986 and 2006](image)

Source: Ker, 2011, using data sources as Figure 4.

### Are Helmets A Barrier to Cycling?

There clearly are people who object to the compulsion to wear a helmet, but the ones we know about are primarily those who choose to ride a bike without a helmet despite the law. The question of whether compulsory helmet wearing is a barrier to cycling is more difficult to answer.

The main reason the question is difficult to answer is that compulsory helmet laws have been in place for two decades and a whole generation has grown up with no experience of the previous situation and, quite possibly, with no experience of cycling at all. Once ‘turned off’ from cycling, either personally or by their parents, people will find all sorts of reasons to justify that position. They may see helmet-wearing as an integral part of the cycling package, but this, in turn, contributes to their overall perception of cycling as an unsafe activity.

Thus, while 20% of respondents to a survey in Western Australia in 2007 (TNS Social Research, 2008) stated that dislike of wearing a helmet affected their cycling behaviour ‘a lot’ (27% ‘to some extent’), the perception, fostered by compulsory helmet laws, of cycling being a dangerous activity would contribute to:

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4 This is known as post-hoc rationalisation, which is an argument made in order to try to justify decisions already made without considering the scientific evidence or in more or less irrational ways.
- Level of confidence riding a bike (24/35%);
- Feeling safe riding around your area (24/40%); and
- Feeling safe cycling on the road (28/40%) (Figure 10).

Figure 10  Attitudes affecting cycling activity

A recent proposal for a Cochrane Collaboration review of cycling infrastructure for reducing cycling injuries in cyclists has cited numerous studies that show the role of infrastructure in reducing the fear of cycling and in reducing injuries (Mulvaney et al, 2013). This potentially explains the disparity between the growth in cycle usage on the Perth Bicycle Network and the long-term decline in the Perth Metropolitan Area as a whole.

Although the few studies of heat stress do not appear to show significant differences in body or head temperature caused by helmets, there may well be a perception that a helmet is more uncomfortable and potentially heat-stress-inducing in hot weather. This may go some way to explaining why the Australian cities that had the greatest reduction in cycling with helmet laws and the poorest recovery (at least as measured by journey to work) are those with the highest annual and summer mean maximum temperatures – Brisbane, Perth and Adelaide (Figure 11).

Figure 11  Cycle journey to work and mean maximum temperatures: Australian capital cities

Source: TNS Social Research (2008)

Safety In Numbers?

A number of studies (see Ker et al 2011, p72, for references) have reported inverse relationships between cyclist numbers and rates of cyclist injuries, suggesting that as levels of cycling increase, injury rates decrease.

Amongst these, Jacobsen (2003) found that “the likelihood that a given person walking or bicycling will be struck by a motorist varies inversely with the amount of walking or bicycling. This pattern is consistent across communities of varying size, from specific intersections to cities and countries, and across time periods.

He concluded that “policies that increase the numbers of people walking and bicycling appear to be an effective route to improving the safety of people walking and bicycling.”

This ‘safety-in-numbers effect had also been noted seven years earlier (Transport WA, 1996) using time-series data for Perth, which also demonstrated, using overseas data, the not-surprising benefits of experience and frequency of cycling for an individual (Figure 12). This combination of influences makes it important, for example, that:

- cycling activity for an individual is not interrupted, for example in teenage years when helmets are often seen as being socially unacceptable; and
- cycling is regarded as a feasible mode of travel for as many trips as possible (to increase frequency) rather than some types of trips being ‘excluded’ by the requirement to wear a helmet.

The consistency between the two conclusions is remarkable. Jacobsen states that “a community doubling its walking [or bicycling] can expect a 32% increase in injuries.” WA data in Figure 12 show a 50% increase in cyclist hospital admissions for a tripling of the number of regular cyclists – equivalent to 33% for a doubling of cycling.

Is The Effect Reversible?

If, as supporters of the mandatory helmet laws maintain, there has been no adverse effect on the level of cycle activity, this is not a question that even needs to be asked. However, this paper has presented evidence to support the existence of a range of direct and indirect adverse effects (including contributing to a view of cycling as dangerous –by implication, more dangerous than activities that do not require a helmet to be worn) that suggests the presumption of beneficence should be questioned.

Whatever the intended and unintended effects of mandatory helmet laws have been, a key issue in considering potential changes is whether the adverse effects are reversible and, if so, whether such reversal would be accompanied by loss of the beneficial effects.
Few people have dared to question the net community value of mandatory helmet laws. Even fewer have addressed the question of what the effect of repealing those laws would be.

Rissel and Wen (2011) report the results of a survey in Sydney:

- 22.6% of respondents said they would cycle more if they did not have to wear a helmet;
- Occasional cyclists (cycled in the past week) were most likely to respond this way –
  - 34.3% of those who had cycled on the day of the survey,
  - 40.4% of those who had cycled in the past week,
  - 33.1% of those who had cycled in the past month;
- Younger people were more likely to respond in this way –
  - 34.1% of those aged 16-24,
  - 28.8% of those aged 25-39;
- Nearly half (47.6%) of respondents said they would never ride without a helmet;
- 14.4% of respondents said they would ride without a helmet ‘all the time’; and
- 30.4% of respondents said they would ride without a helmet ‘some of the time’.

Whilst this is an area that would benefit from further research, as part of a broad-based inquiry into helmet laws, the results of Rissel and Wen (2011) indicate that there would continue to be a high rate of helmet-wearing even without the legal requirement to wear one.

There is, however, a possible issue of concern with those aged 16-24, who were most likely to say that they would ride more (34.1%) and also most likely to say they would ride (all or some of the time) without a helmet (66.9%).

**What’s It Worth?**

The benefits of cycling go well beyond the areas of health and safety (Ker, 2014). The health and safety benefits of cycling are only a small part of the overall community benefits (Figure 13) and even if all cycling activity foregone were to be replaced by equivalent other physical activity, the non-health benefits of less cycling would be sufficient to make the case that less cycling is not in the best interests of the community.

**Figure 13  Components of cycling benefits**

Whilst the health benefits alone might not be sufficient to justify investment in cycling infrastructure and associated programs, they are just one part of a broader spectrum of benefits that sees the benefits typically exceed the costs by a factor of more than three. A report for the RAC (Ker, 2012) determined that the economic, social, health and environmental rate of return on investment for cycling infrastructure to the community was between 3.4 and 5.4 times the cost incurred, and financial
returns to individuals and to governments are nearly twice the cost incurred. Benefit-cost ratios of 3+:1 are higher than for other typical urban transport investments (Ker, 2014).

Economic analysis by the SKM and PWC for the Queensland Department of Transport and Main Roads (2011) determined that the net health benefit (minus injury costs) for each kilometre cycled is $(2010)0.75. The injury costs were calculated to be $0.37 for cycling. The study concludes that although capital costs for project vary widely, a typical off road path located in an inner urban area with 1000 bicycle riders per day would generate discounted benefits of around $15 million per kilometre over a 30-year appraisal period ($1.43 per kilometre cycled).

In New South Wales, PWC (2011) estimated the net benefits of cycling to be 48 cents/km, despite a very low value for health benefits (1.4 cents/km).

**Overcoming Policy Inertia**

In some places in the world, there is provision for ballots to be held to determine issues (eg many States of the USA and the Cantons of Switzerland) or to have issues debated in the public arena.

There is a burgeoning virtual community around the development of electronic petitions for a whole range of purposes, but electronic petitions do not meet the current requirements for presentation to, never mind being debated in, state or federal Parliaments in Australia.

However, the UK Government has put in place a formal process to co-ordinate petitions to Government/Parliament and to allow those that get sufficient support to be debated in the House of Commons (Figure 14). In the two years since this system was put in place, 7.2 million people have signed one or more petitions on the site and 19 of those petitions have been debated in the UK Parliament, having achieved the required 100,000 signatures.

On the basis of relative population, this is equivalent to 35,000 signatories in Australia or 3,500 in Western Australia.

Complex issues, especially those that have strong technical and emotional aspects, do not easily lend themselves direct democracy. Electronic petitions and a formal process for dealing with them would, however, at least provide an avenue for having them addressed in a transparent way.

**Conclusion**

For a range of reasons, public policy can be unresponsive to legitimate questioning. It is understandable that those charged with implementing policy might not be amenable to questioning the policy itself, which puts the onus on interested and knowledgeable members of the community to do so. At present, there are few mechanisms to facilitate such questioning to be effective, but e-
technology and social networking provides opportunities for responsible raising of issues leading to objective analysis, debate and response.

In the case of Australia's mandatory helmet laws, there is a systematic unwillingness to review their value to the community, despite there having been no assessment prior to their introduction and only limited post-implementation analysis. In particular, there is an apparent aversion, despite all the available evidence, to considering the negative effects on cycle usage and the consequent adverse impacts on health and fitness, congestion and environmental outcomes – and even on the safety of those who do continue to cycle.

It is left, therefore, to the knowledgeable and interested outsider to at least establish that policy may be in error and have outcomes that may negate any positive achievements.

Evidence on cycling in Perth, Western Australia, shows a substantial decline in cycle usage around the time of the introduction of mandatory helmet wearing that has not been recovered from except where there has been heavy investment in cycling infrastructure. Overall, cycling’s share of transport activity declined by two-thirds between 1986 and 2006, with the decline concentrated on short-distance utility trips, mainly on local streets, that are likely to be the lowest-risk trips for cyclists.

The continual reported increases in cycling, primarily for commuting and recreational purposes, in inner metropolitan areas of Perth over the same period demonstrates that cycling activity in middle and outer suburbs has collapsed.

This decline has had adverse health impacts on and increased the cost of transport to individuals and the community, as well as making cycling less safe for those who continue to cycle. It has also denied the community the very substantial benefits of cycling through lower transport costs (direct car operating costs, congestion costs and the cost of car parking).

The inescapable conclusion is that the Western Australian community as a whole is substantially worse off as a result of mandatory helmet laws.

A number of key issues remain to be answered, including:

- Are the adverse effects on cycle usage reversible, given that we now have a generation of non-cyclists for whom compulsory helmets have established a fear of cycling as a dangerous activity?
- Is it possible to avoid the knee-jerk political response (as by the Queensland Minister of Transport in response to the Parliamentary Inquiry recommendations) that ‘helmets work’ – failing to see the distinction between individual safety, on the one hand, and population/economic health, on the other?

References


