

# Using Positive Psychology insights to meet cyclists' and motorists' challenges of seeing one another's perspectives in traffic conflicts

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## ABSTRACT

The aim of this conceptual paper is to help understand some challenging interactions between drivers and cyclists, putting them at serious risk. The idea is to create insights on why drivers often say “sorry, I didn’t see you” and on the causes of their distractions and negative preconceptions and associations. A lot of research has been conducted with the goal of improving cycling infrastructure and vehicle technology to improve the safety of cyclists. However, in the foreseeable future, the great majority of cyclists around the world will have to manage riding on roads that have no dedicated cycling infrastructure, and will have to share the road with vehicles that have no sensors or cameras that enable drivers to be aware of their presence. Furthermore, cyclists have no control over these things when they are riding or the behaviour of drivers around them. Based on these insights, our goal was to use positive psychology interventions to help cyclists to employ effective strategies, giving them more control when sharing the road with motor vehicles, and encourage them to enjoy the experience. Given the lack of formal scientific research in this area, the writers hope the concepts in this paper will serve to encourage research projects that might investigate the suggestions the authors are making. Survey information from the Share the Road [1] Campaign’s workshops and a New Zealand Transport Agency report [2] provided insight into what New Zealand drivers and cyclists were thinking about each other. Applying positive psychology perspectives and methods may lead to improved ‘theory of mind’ [3] skills in cyclists and drivers alike. This, by definition, could help them to understand each other’s perspectives, which in turn, may lead to predicting each other’s future behaviour more quickly, giving them more time to respond. Approaching one another with an open mind increases positive emotions, which, according to Frederickson’s ‘broaden and build’ theory [4], can help in ‘widening the array of creative and useful thoughts and actions’. This will assist them to be non-judgmental and less resentful and instead deepen their feelings of compassion and forgiveness when others make mistakes.

**Keywords:** theory of mind, predicting behaviour, positive psychology, behavioural change, road sharing, cyclists.

*The night was clear. The traffic was becoming intense. The long hours I had spent in my office had taken a toll on my focus. What was this angry outburst from my colleague all about anyhow? - And then it all started. The lane was not wide enough for a vehicle to pass, I rode in the middle, so they would not try. However, this must have upset the bus driver behind me as she followed about 1 metre back revving her engine. I was terrified, this woman had a problem and I did not know what to do. As soon as there was a gap in the oncoming traffic, she roared by leaving 30cm between us. I hung on for dear life trying not to wobble as the full 13 meters of bus finally went past before swerving across my path into a bus stop. Shocked, I banged on its side as I went past and shouted, "Leave more space next time!" As my pulse started to settle, I was caught completely unaware as she came up to me again at high speed. The side of bus closed in as she squeezed by the traffic island in the middle of the road, then the door of a parked car opened, I had nowhere to go...*

## **1 INTRODUCTION**

Almost every cyclist could tell you a similar story - and just reading this makes you feel anxious about the bus driver who obviously had an anger issue - and what happens next after the door of the parked car had opened? In such situations, everyone misses out - not only the cyclist. Crashes cause traumas for everyone involved in some way.

Experiencing negative emotions such as anxiety, anger and fear may help us to deal with danger and emergencies. However, they are not helpful for negotiating challenging traffic conflicts. These emotions trigger 'response tendencies', making us feel like fighting or running away - and even worse, in some extreme situations, we might 'freeze', unable to think and do anything useful. Surveys [2] shows that drivers' negative associations relating to cyclists in general, can be caused by one bad experience. Such associations in the New Zealand culture of road users (dominated by drivers) contribute to the many reasons why cyclists are often considered as 'second grade' road users, not seen or actively ignored, and subsequently not passed or followed safely.

The number of people choosing to ride a bicycle for exercise, recreation, competitive sports and most importantly for transport is growing in the western world. Except for much of Europe, cyclists still make up a small minority of road users. The motorists belong to the 'in-group' and their often-observed emotional responses against cyclists can result from stress due to congestion, the perception that cyclists are being favoured and the problems associated with seeing them.

The aim of the research undertaken to write this conceptual paper was firstly to understand the reasons for anecdotal reports from cyclists about feeling unsafe on the road and why drivers have difficulty sharing the road with those who cycle. Then based on the learnings gained and given that cyclists are the ones most likely to come off worst should a crash occur with a motor vehicle, provide cyclists with practical on road strategies to reduce the likelihood of negative experiences, injury or death.

Much work has been done to improve roading infrastructure and vehicle technology to increase the safety of cyclists. However, with the exception a few northern European countries such as the Netherlands, Denmark and parts of Germany, and some cities, the great majority of cyclists ride unprotected from motor vehicles. Increasingly upmarket new cars and trucks have warning cameras and sensors to alert the driver to the presence of cyclists, but again the great majority of motorists do not have these features in the vehicles they drive. When on the

road, cyclists have no control over the infrastructure they are riding on, the technology of the vehicles they share the road with or the attitudes and behaviours of other road users. To achieve the aim of this paper, new thinking was required to provide cyclists with ways (they have control over) to be safe. It is hoped this knowledge could lead to improving their attitudes towards drivers, and finally change their behaviour to reduce the likelihood of conflict. Little scientific literature exists in this area, so sources of information include informal “grey” articles found in newspapers, advocate websites and personal experiences the writers have used in their daily encounters with the problems outlined. It is hoped that the ideas being presented will be tested scientifically to prove whether the concepts have validity.

To understand the challenges of motorists and cyclists seeing each other’s perspectives, two main sources of information were utilised. The New Zealand Transport Agency (NZTA) funded Share the Road Campaign has been working with drivers of heavy vehicles and cyclists<sup>1</sup>. Almost 6,000 people have been engaged in the Share the Road campaign by way of workshops, truck/bus blind zone demonstrations and presentations. The goal of the campaign is to improve road sharing between these groups. A survey [1] was commissioned by NZTA to review the campaign. Workshop participants were questioned to ascertain the effectiveness of its activities. Secondly the NZTA commissioned another report published in Oct 2017 called *“Encouraging behaviour change between motorists and cyclists”*. The goals of this research were like those of the Share the Road campaign, but broader and not restricted to heavy vehicle drivers. Attitudes about and perceptions of cyclists, their behaviour and best practice were gained from the drivers who participated in the survey.

Based on the information in Section 2 from the surveys undertaken, relevant literature and informal sources, the writers of this paper contend in that understanding what motorists are thinking, and mastering avoidance strategies are an important first step for cyclists to overcome. In Sections 3 and 4, the writers suggest that by employing Fredrickson’s broaden-and-build theory [4] of positive psychology which claims better communication, empathy and forgiveness; cyclists can find creative solutions to conflict leading to fewer incidents, less rule breaking and more positive riding experiences. Lastly Section 5 discusses practical on road strategies they could employ to stay safe on the road. By understanding the need for good cycling skills, being visible and predictable, the road environment and other external factors, we are suggesting cyclists can control encounters with the drivers they share the road with. The Conclusion in Section 6 proposes a new paradigm of road sharing that suggests by consciously using positive emotions when engaging motorists, cyclists can shake off the victimhood of being a vulnerable road user and become a full member of their community of road users with all the associated rights and responsibilities.

## **2 WHAT ARE THEY THINKING?**

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<sup>1</sup> While there are issues with cyclists common to all motorists, there are more problems associated with heavy vehicles and cyclists even though heavy vehicles only make up a small percentage of the total number of vehicles on the road. 10 of the 18 cyclists killed on New Zealand Roads in 2017 were because of crashes with heavy vehicles [5]. For this reason, the scope of this paper is primarily around the interactions between heavy vehicle drivers and people who cycle.

## **2.1 NZTA Research “Encouraging behaviour change between motorists and cyclists”.**

There were two methods employed in the NZTA research exercise referenced in this paper. In Co-creation sessions (focus groups) two groups of 12 motorists and cyclists met in two cities over an extended period. Secondly, a 15-minute quantitative survey was completed by 1,507 motorists including a “robust sample” of parents with under 12-year-old children, and cyclists [2].

According to Carruthers (2017) [6], it is unrealistic to think that drivers and cyclists are equal on the road, (see also Bushman et al., 2018) [7] linking narcissism and aggressive driving. None of this is good news for those who cycle. They must deal with three fundamental tensions according the results of the NZTA survey [2]. Firstly, the “My road/ Our Road” conflict exists where the culture of road users in New Zealand is dominated by the majority who are drivers. Secondly, because most roads are not designed with cyclists in mind, there is confusion over rules, what road users should do and what they might expect others to do. In countries where there are more cyclists, injuries and fatalities are fewer as there is a greater awareness about what cyclists are likely to do [8]. Thirdly, the idea that power and duty of care tends to rest with one group irrespective of whether they want it or not. Jones [9] argues that making cyclists wear helmets in New Zealand shifts the duty of care to cyclists absolving other road users, road designers and legislators of their duty of care.

The negative tension between cyclists and motorists was strongly reflected in the NZTA [2] survey results; over half of cyclists were reporting a lack of confidence, not feeling safe, and have expressed biased perceptions, for example; “New Zealanders are terrible drivers - No one indicates”. While cyclists make up 48% of the total motorist population, only 15% cycle regularly.

Very few cyclists were associating themselves as group, road or fast cyclists. Interestingly, motorists reported observing these types most frequently on the road - and rated them as most annoying. These strong perceptions colour their attitudes and beliefs creating an idea that cycling on the road causes fear and frustration. The top 5 concerns reported by those who cycle when on the road include; drivers not seeing them, a vehicle hitting or running over them, safety, other vehicles generally and not enough space being given when being passed [2].

Drivers negative associations relating to cyclists in general, which can impair judgement re passing timing/distances - can be caused by one bad experience, near miss or crash. Even not liking cyclists can make them harder to see [10].

While most motorists reported feeling neutral towards those who ride bicycles, 24% of motorists (who are also cyclists) felt negative towards cyclists and 38% felt positive towards cyclists. Only 28% of motorists who do not ride reported positive feelings towards cyclists. Positive behaviour towards and by cyclists is being noted by motorists, although inconsistencies are evident in their reports. Finally, there is a sense that special treatment is being directed to cyclists, cycling infrastructure is an unfair inconvenience and all the sacrifices are being made by those who drive. If only those who pedal could see into the minds of drivers, would the insights put them off riding?

## **2.2 Share the Road Workshops**

Insights were drawn from heavy vehicle drivers who ride bicycles in Share the Road workshops and cyclists who sit in the driver seats of trucks and buses. They are asked in post workshop surveys what they would like the other to know about their daily on-road experience and how their attitude and knowledge has changed after “swapping seats”. The results obtained was referenced in a Programme Review [1].

The workshops surveys asked the following questions.

### **2.2.1 Driver Workshops**

1. Thinking about the last month of driving, how many near misses, or confusing incidents with cyclists did you have?
2. The degree to which they agree with the statement(s) below:
  - The workshop has increased the chance of you following a cyclist at a safe distance.
  - The workshop has increased your patience with cyclists who ride 1 meter from the kerb or parked cars.
  - The workshop has increased the chance of you passing a cyclist safely.

### **2.2.2 Cyclist Workshops**

1. Thinking about the last month of riding, how many near misses, or confusing incidents with heavy vehicles did you have?
2. The degree to which they agree with the statement(s) below:
  - The workshop has increased your confidence when passing a heavy vehicle.
  - The workshop has increased the chance you will ride to be seen.
  - The workshop has increased the chance you will choose safe routes.
  - The workshop has helped you to feel more comfortable sharing the road with heavy vehicles.

In surveys undertaken 6 months after the workshops, among other things they are asked about the number of negative “incidents” they have with each other. The following RESULTS were from Share the road workshops held between Jan 1<sup>st</sup>, 2016 and June 30<sup>th</sup> 2018 [1]. On average 50% reported having no “confusing incidents or near misses” with cyclists or drivers directly after the workshop in the last month. 20% reported having one, 15% two and 15% had three or more (n=446). In the surveys conducted 6 months after the workshop, the numbers having no incidents or near misses had grown to 70%, with similar numbers (15%) having one, and 5% having 2 or 3 or more incidents (n=88). While the sample size is small, and the survey unscientific, the results were encouraging.

On average 86% of drivers surveyed agreed or strongly agreed with the Driver Workshop Statements above. 84% of cyclists agreed or strongly agreed with the Cyclist Workshop Statements above. Again, the writers state these surveys are relatively informal with written information being gather after the workshops, and an online survey being undertaken 6 months later by those who gave their contact details. It is hoped that readers will be interested in the new concepts being presented here and will undertake a formal research approach to test the results.

### **3 POSITIVE PSYCHOLOGY AND THE EFFECT OF POSITIVE EMOTIONS**

For the remainder of this paper, positive psychology approaches will examine changes in behaviour and mind-sets by facilitating positive emotions, which would, most likely, improve the outcomes of traffic conflicts between cyclists and motorists. First, translated into traffic contexts, Fredrickson's broaden-and-build theory [4] predicts, that if cyclists and motorists experience positive emotions, they are more likely to be able to engage in 'broadened' cognitive functions. This can result in better communication and being able to feel more empathy, leading to understanding and forgiveness for the other party 'at fault' in a conflict situation.

Positive emotions also broaden our senses, while negative emotions narrow them. When cyclists are in a positive mood, they are likely to be more open-minded, creative in finding solutions to problems - for example by avoiding heavy traffic using alternative routes.

Let's first look at the application of Polyvagal theory as it relates to negative emotions. Building on the use of these concepts and the broaden-and-build theories mentioned above, we will then look at four fundamental factors leading to safer driver/cyclist interactions, using positive psychology insights.

### **4 POLYVAGAL THEORY AND NEGATIVE EMOTIONS**

Strong negative emotions (such as those which arise in traffic conflicts) do have adaptive functions - but they also restrict us in our choice of responding - a bit like crocodiles and rabbits, whose only options are either fighting (crocodiles) or running (rabbits) when danger is perceived. Polyvagal theory [11] suggests that more evolved humans have a wider array of options available than animals when there is a threat. Cyclists may use a so-called 'social engagement' system. This system allows them to respond more reasonably in dangerous situations. It allows them to negotiate by using facial expressions, change of voice tone and improve their perceptions so that their responses are based on more accurate information.

However, if a bus follows a cyclist too closely and evokes a profound fear response, the polyvagal responses do not help much. First, the sharpened perceptual system is not able to provide more information about the vehicle behind them. In addition, the 'social engagement' system fails as there is no face-to-face interaction with the driver of the bus that would allow facial expressions to be effective - and changing the voice tone goes unnoticed. Their bicycle does not allow them to 'outrun' the bus and the only options left are fighting or freezing. Cyclists in this situation often yell at the driver 'at fault' and do not have the capacity to generate insights that could help them to deal with the situation more reasonably and efficiently - and to learn avoiding similar incidents in the future.

### **5 POSITIVE PSYCHOLOGY INSIGHTS THAT CAN LEAD TO CYCLISTS BEING IN CONTROL**

#### **5.1 HAVING GOOD CYCLING SKILLS**

As a no brainer, good cycling skills lower the risk of crashing - but this paper is not the place to help cyclists hone these skills, there is plenty of information available on what makes a skilled cyclist, for example, Hulls [12], a 'Share the Road' workshop facilitator summarises, "Bicycle control is about being able to ride where you want to go, when you want to go there". To avoid collisions or near misses with heavy vehicles in traffic conflict situations, cyclists should understand where motorists' blind zones are, and the way rear wheels can track inwards when

long vehicles turn. Safety concerned cyclists do not ride distracted, such as by looking at screens, listening to in ear music, making phone calls, etc. Fatigue, drugs/alcohol, and stress may further reduce cyclists' ability to control their bikes.

Positive psychology would encourage cyclists to savour consciously the positive emotions they experience when they master control over directional changes, environmental limitations and interactions between both. These positive emotions will help undo negative emotions ('undoing theory', Fredrickson [4]) should they arise in less controlled situations.

## **5.2 BEING VISIBLE AND PREDICTABLE**

As mentioned previously in the Section 2, one of the five top concerns of cyclists are about motorists not seeing them and this is indeed understandable, justifiably decreasing the level of confidence in cyclists. For instance, eye tracking technology in an experiment conducted for the insurance company 'Direct Line' showed that motorists do not see more than one in five cyclists [13]. In attentional blindness according to Pammer and Bink [14] is likely to occur when the motorist looking is engaged in another activity - for example a deeply involved phone conversation.

Naturalistic driving research found that distraction is one of the biggest risk factors that contribute to drivers not seeing those on bicycles. Screens, fatigue, drugs/alcohol and stress contribute to reducing effective hazard perception. Furthermore, only 3 percent of the visual field is in high visual acuity (central vision) - the rest is blurred (peripheral vision). This is exacerbated by the tunnel vision impact of speed [15]. In addition, there are many barriers to vision including driving conditions caused by sunstrike, rain, mist and low light [16].

Positive psychology would recommend cyclists focus on what they can control. For example, they will be easier to see riding further into the lane in a straight line instead of swerving to avoid roadside obstructions such as drain covers, broken glass, and parked cars. Wearing light or bright (contrasting) clothing, using bright lights will help. Riding in areas which motorists are most likely to scan regularly for cyclists can be helpful, for example positioning themselves to be seen at intersections. Positive mind-sets in cyclists allow them to 'broaden' theory of mind related skills, 'realising' when motorists experience restricted situational awareness and take precautionary actions.

## **5.3 ROAD ENVIRONMENT AND OTHER EXTERNAL FACTORS**

With a few exceptions in New Zealand, the roading network has been designed for cars. In a report commissioned by Auckland Transport, the roading network design was heavily criticised for giving priority to driver convenience over safety, particularly for vulnerable road users [17]. The way roads are laid out provides cues to users to behave ways when they are driving, the overriding message is often "cyclists, this road is for cars, not you" [18]. Cyclists are of course not able to control the roading environment - but they can be aware of different levels of challenges.

There are many external factor issues relating to vehicles that impair the drivers view of those they share the road with, these include; door pillars, mirrors and window design. Higher safety standards, larger truck cabs and heavier door structures have all contributed to heavier and bulkier A-pillars, which create larger blind zones in trucks. The need for cab structural integrity limits the size of windows [19]. Mirrors are always difficult as heavy vehicle drivers can have up to 6 or 7 to scan as well as screens and what is in front of them. Drivers response time to

what they see in mirrors is slower than what they see through the windows [20], when articulated trucks turn, all one can see on the inside mirror is the side of the truck. Trucks present a variety of visual barriers that while present in all vehicles are accentuated by their size. These include the fact that often drivers sit very high due to the size of the engine and transmission. This has a detrimental effect on being able to see things close to them. Drivers struggle to see traffic coming alongside them on the passenger side, stickers, labels, air intake ducts, bug catchers, sun shields, electronic toll devices further reduce what can be seen [21].

Positive Psychology approaches predict that cyclists need to identify signature strengths and skills and use them to overcome these serious challenges. For example, if a cyclist can learn situational awareness and hazard perception skills, they could use them to mitigate some of the issues generated by external factors. Also, positive emotions can help broaden their visual field from where the cyclists can extract information, minimizing the severity of the road environment challenges discussed above.

#### **5.4 EMPOWERING POSITIVE EMOTIONS**

As we all know, many things and events cannot be controlled, however, we can control the way we respond to them. Positive psychology suggests that creating consciously positive emotions in challenging situations has many benefits. They create a mind-set that allows road users to 'open up', widening their useful field of view, improving situational awareness, responding to challenging situations in a conscious reasonable way. They are conducive to improved creativity, and innovation expansion. A recent study by Isler and Newland [22] indicated that high levels of wellbeing and life satisfaction (as measured by PERMA, Peterson et al. [23]) relate well with participants' lower intention to violate traffic rules - and indeed these people experienced less incidents as per number of traffic infringements, near misses and crashes. Another study linked higher levels of mindful driving with less self-reported incidents, and yet another study linked happiness levels with more effective eye-movements and improved hazard perception. There are many ways we can get control over emotions in response to events (Gross [24]), ranging from cognitive restructuring of negative events (creating a more positive narrative) to fully accepting those events and consciously trying to create positive emotions instead.

Survey results from the Share the Road workshops indicate more awareness, better knowledge of the needs and constraints of the other, and fewer incidents between heavy vehicle drivers and cyclists [1]. Participants agreed that their increased knowledge of "the other" led to more positive attitudes encouraging better behaviour and fewer "incidents". Anecdotal reports suggest that the workshop experiences gave participants the confidence to try to consciously engage positively with other road users and suppress negative emotions should they arise.

#### **6 CONCLUSIONS**

In summary, this conceptual paper suggests that recent theories and models of positive psychology can offer a new approach to meeting the challenges of motorists and cyclists seeing one another's perspective in traffic conflicts. It was suggested, that instead of focusing on things that cannot be controlled, (e.g., road environment) awareness and acceptance should be put in its place. Moreover, instead of maintaining a conscious sense of mistrust, resentment, anger and annoyance resulting in a mix of negative emotions, the new approach



will encourage motorists and cyclists to work collaboratively together - and feel the positive energy of creating a safer space for everyone.

The goal would be to create a traffic community who watch and reach out for each other, truly share the road and facilitate the development of positive emotions, which will help to see each other's perspectives, leading to increased understanding, and forgiveness. If unwanted behaviour does get sensed, instead of assuming the worst - it should trigger a healthy level of curiosity raising the question 'why is this happening?' and creating compassion for the counterpart, acknowledging the uncomfortable space the 'perpetrator' might be in at this point.

Imagine the results of a future survey from New Zealand Transport Agency, in which all cyclists self-report confidence and safety on the road, numbers of cyclists are soaring and most motorists taking up cycling in their free time. We ask you to read the story below and observe your emotional reactions. We predict that instead of anxiety it will trigger positive emotions - which may help you become part of a movement of real change in spaces where conflict between cyclists and motorists often end in unnecessary casualties. Will this story inspire you to action and to think broadly about how you and others could contribute to safer spaces on the road?

*The night was clear, just a nice soft breeze, and little traffic as most motorists had switched to public transport using sustainable energy. I noticed the moon illusion - appearing much bigger when rising from the horizon. In addition, I heard the distinctive 'more-pork' call from a morepork, a wonderful native owl species. It is going to be a great ride home - I felt positive energy going through my whole body. The lane was not quite wide enough for a vehicle to pass so I rode near the middle. I could hear an electric bus approaching, I turned to the driver, smiled and waved. She nodded back looking surprised and slowed down giving me more room. What a kind gesture. This made me feel safe and gave me the opportunity to focus and spot a section of road marked 'no parking', where I could ride closer to the curb, giving her room to pass. She tooted thank you. The bus was packed. As I passed her further down the road pulled in at the bus stop, I gave her a thumbs up. I was still in front when we approached the traffic Island. She slowed down until I was through, she waved when passing with a generous amount of space before disappearing into the night. I suddenly felt that we are in this together, I picked up speed, the endorphins kicked in, I felt flow feelings and the ride home was great, indeed! I felt good, and if positive psychology works and there is plenty of evidence - the bus driver felt good too.*

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