The Dangers of Speeding: Why an Ethical Approach to Speeding Education is Superior to the Current Consequential System

A Research Paper submitted to the Department of Engineering and Society

Presented to the Faculty of the School of Engineering and Applied Science
University of Virginia • Charlottesville, Virginia

In Partial Fulfillment of the Requirements for the Degree
Bachelor of Science, School of Engineering

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Spring 2021

On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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Introduction

In 1901, speed limits were introduced in Connecticut to restrict how fast drivers could travel as a way of trying to reduce the number of car accidents. However, people do not always abide by this set limit. Every year, there are "nearly 41 million speeding tickets" issued to drivers ranging in cost from $50 to $2,500 (Boe, 2020). According to the National Highway Traffic Safety Administrations (NHTSA) 2018 data, 9,378 deaths in car crashes involved a speeding driver, which is 26% of the total traffic deaths for the whole year (pg. 2). Additionally, when looking at the percentage of speeding drivers involved in fatal crashes, males were more likely to be speeding in every age group (NHTSA, 2018, pg. 2).

Speeding is a common practice, regardless of the fact we are repeatedly warned of the dangers, and data on crashes is readily available to the public. Assuming that drivers know that the speed limits exist for the safety of themselves and others, and if they decide to go past them they will receive a ticket, it does not make sense that speeding is so commonplace. It is believed that there are five main reasons why people are more likely to speed: lack of time, familiarity, thrill seeking, road rage, and overconfidence (Curtis, 2020, Why do People Speed?). The current system built to deter speeding, being pulled over and given a ticket, has proven ineffective as there are thousands of people killed by speeding drivers every year. Instead of building a system based on consequences and punishments, we should reassess how we educate drivers to think about speeding, emphasizing the ethical dilemma to highlight their impact on others. Using Slovic's Risk Perceptive lens, a tool which assesses individuals' reaction to danger, to evaluate the psychology behind speeding, we can work towards a new approach in speeding education.

Part 1: The Consequences of Driving Over the Speed Limit

Speed is one of the top reasons people get into car accidents. Speed is often stereotypically associated with younger drivers; high school or college students trying to go as fast as they can. But statistically this is not true. People speed every day for a variety of reason and without thinking about the consequences. Any car accident can cause "death or serious injury including whiplash and concussions" to drivers and those in other cars, and these injuries are exponentially worse when speeding is involved (AZ Big Media, 2019, Speed). As seen if Figure 1, in the year 2018 speeding resulted in up to half of all traffic deaths in a given state.

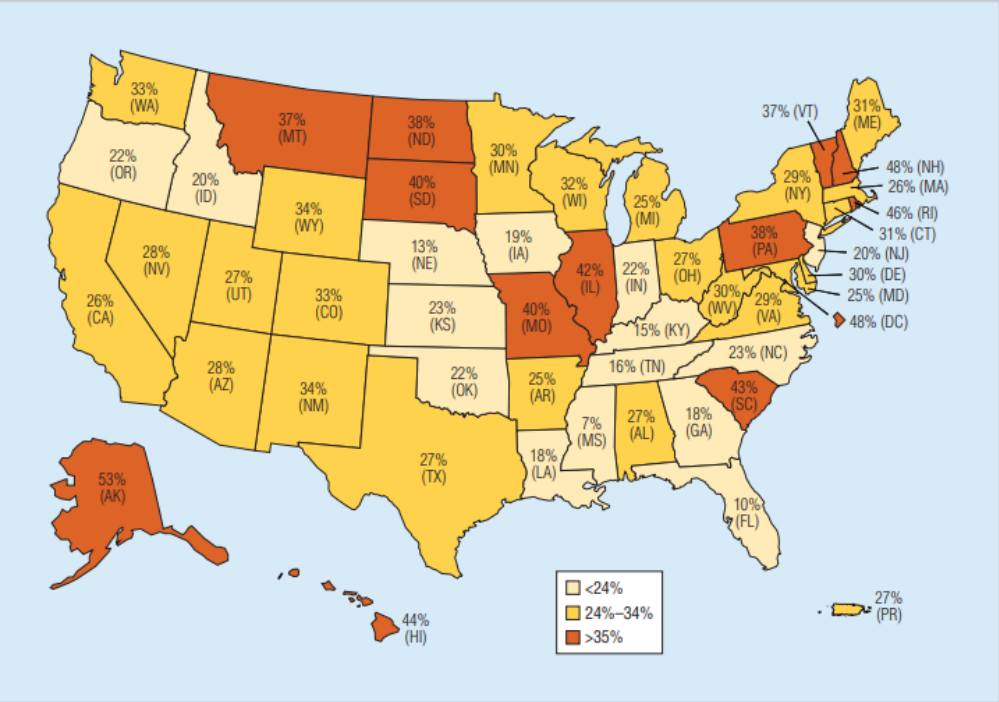

Figure 1: A map of the United States showing what percentage of all traffic fatalities were related to speed by one or both drivers involved in 2018. (NHTSA, 2020, pg. 11)

Another common misconception of speeding is that it mostly occurs on Interstate roadways. However, "of the 9,299 speeding-related fatalities in traffic crashes in 2018 with known roadway function class, 3,848 (41%) occurred on rural non-Interstate roads" (NHTSA, 2020, pg. 9).

Additionally, another 44% of all speeding-related fatalities occurred on urban non-Interstate roads (NHTSA, 2020, pg. 9).

Dangers of Speeding in Inclement Weather

Speeding is just one of the many contributors that can result in car accidents. With the addition of different weather conditions, the probability of an accident rises. The Federal Highway Administration collected statistics from 2007 to 2016 and found that there were 5,376 people killed due to the presence of wet pavement, rain, snow/sleet, icy pavement, snow, or fog (USDOT, 2020, Weather Impacts on Safety). When looking at the speed limit signs, it is assumed that that speed limit is set and should be always followed. However, according to the U.S. Department of Transportation (USDOT), "speed limits in speed zones are established for favorable conditions – good weather, free flowing traffic, and good visibility" (USDOT, 2014, pg. 11) This fact is not common knowledge, so drivers often fail to slow down when the weather conditions are not ideal. This makes hazardous weather conditions responsible for ~21% of the more than 5.8 million vehicle crashes that occur each year (Dolce, 2018, At a Glance). It can be seen in Figure 2 that drivers were not prepared for the winter weather and did not leave adequate stopping space between them and the car in front of them resulting in a massive pileup crash.

Figure 2: By not adhering to the speed limit or altering their speed, drivers were unable to stop on the icy and snow-covered road. As a result, there was a massive pileup cause all lanes of traffic to be blocked. (Dolce, 2018)

With the dangers of winter weather conditions, it would be expected that December, January, and February would contain the most vehicle deaths. In reality, the summer months have "29% more deaths in car crashes than winter months" (Arevalo, 2021, Summer vs. Winter Driving Stats). Without these hazardous weather conditions, the main contributor can be directly linked to the speeding of drivers. According to the USDOT's Speed Management Program Plan from 2014, "the probability of severe injury increases sharply with the impact speed of a vehicle in a collision." And even with the abundance of data on the dangers of speeding, people continue to do it on a regular basis. According to a national survey, "about three-quarters of drivers reported that they drove over the speed limit on all types of roads within the past month, and one-quarter reported speeding over the limit on the day of the interview" (USDOT, 2014, pg. 12).

Before 1995, the Federal Government was in charge of setting a national speed limit. During Nixon's presidency in the early 1970's he implemented a national speed limit of 55 mph

to save money from the rising fuel prices (History.com, 2009, n.p.). As a result of the speed limit being decreased across the country, the "traffic fatality rate dropped from 4.28 per million miles traveled in 1972 to 2.73 in 1983" (American Safety Council, 2014, National Limit of 55 mph). After the fuel shortage ended in the 1980's, the speed limit was raised to 65 mph and was then turned over to the states control in 1995 (American Safety Council, 2014, Freedom v. Regulation). The states have been in charge of setting speed limits since that time, and many states raised their interstate speed limits to 70 mph or above in the 2010s.

There are several possible outcomes that come with being a habitual speeder including car accidents, tickets, and tailgating. Tailgating is often trivialized, and people rationalize this action by thinking it is a good way to let the driver in front of you know that they are driving too slowly. In fact, tailgating can be more dangerous than speeding. Tailgating is the act of driving behind a car too closely, which creates a dangerous situation as it gives you a short amount of time to react to a driver braking. There are three different breakdowns of how far a driver should follow the car in front of them, the 2 second, 4 second, and 10 second rule. The 2 second rule is that a driver should allow at least 2 seconds of space between them to allow for proper breaking time in ideal weather conditions (Phillips, 2020, Problems with Following Too Closely). The 4 second rule applies when the pavement is wet or icy from rain or snow, and the 10 second rule is for if there is bad weather that reduces visibility and the pavement is slick from precipitation (Monfort, n.d., Tailgating Timing Rules).

Through the use of Slovic's Risk Perception, we can attempt to understand factors that persuade drivers to slow down (Slovic, 2010). Slovic focuses on the idea of the psychometric paradigm, which is the ability of the brain to "produce meaningful representations of risk attitudes and perceptions" (pg. 55). Using the psychometric paradigm, a better understanding of

why people do not feel that speeding increases the risk of death to themselves or others can be found. The current method of having consequences has not been effective, therefore, a new method needs to be introduced.

Part II: Slovic's Perceptive Lens Applied to Drivers

To understand Slovic's Perceptive lens, one needs to have a general idea of what happens in the brain during decision making. When behind the wheel of a car, the brain is processing information from many different places. These can be from listening to the radio, looking at the road, and the breeze coming from the air conditioning. One of the most important processing that occurs is spatial awareness. When driving, drivers look around and must determine whether they are a safe distance from the other drivers and making sure they are out of harm's way. However, people will throw safety out the window if they can drive faster than the speed limit to get to their destination sooner. When driving down the road, it is apparent that "most people don't think twice about going five to ten miles over the speed limit, and there will be plenty more who zoom right past them" (Conan, 2007, n.p.).

Research of the human brain has been ongoing for centuries, and there are still many mysteries we do not understand. One thing we have determined is how the brain is structured. There are four separate hemispheres, the frontal, parietal, temporal, and occipital lobes. The portion that controls decision making is the frontal lobe. This part of the brain is also in charge of "voluntary movement, expressible language, and for managing higher level executive functions" (Queensland Health, 2021, Brain Map Frontal Lobes). Executive functions are the ability to "organize, initiate, self-monitor, and control one's responses in order to achieve a goal" (Queensland Health, 2021, Brain Map Frontal Lobes). In one experiment analyzing the brain's decision-making process, it found that decisions can be made without us realizing it, effectively

subconsciously. During the study, researchers found "[they] could predict what choice people would make seven to ten seconds before [the subject was] even aware of having made a decision" (Weinschenk, 2019, Most of Our Decisions are Made Unconsciously). By knowing that decisions can be made without realizing it, it is apparent that there are two different ways people make decisions. The first method is "a fast, unconscious, often emotion-driven system that draws from personal experience," meaning that people react to the world around them without having to put any thought into it (Wargo, 2011, Fast and Slow). The second method is "a slower, more deliberative and analytical system that rationally balances benefits against costs among all available information" (Wargo, 2011, Fast and Slow). Knowing more about how an idea and decision is formed in the brain and transmitted into action, Slovic's Risk Perception can be used to understand how drivers validate the decision to speed.

Slovic's Risk Perception is the examination of how difficult it is to explain to the public how risky certain things are. Slovic states that "any factor that makes a hazard unusually memorable or imaginable, such as a recent disaster, heavy media coverage, or a vivid film, can seriously distort the public's perceptions of risk" (Slovic, 2010, pg. 50). In Figure 3, a graph is used to demonstrate how certain events are viewed. The y-axis represents how much we know about the risk involved, and the x-axis represents how much is dreaded about each item.

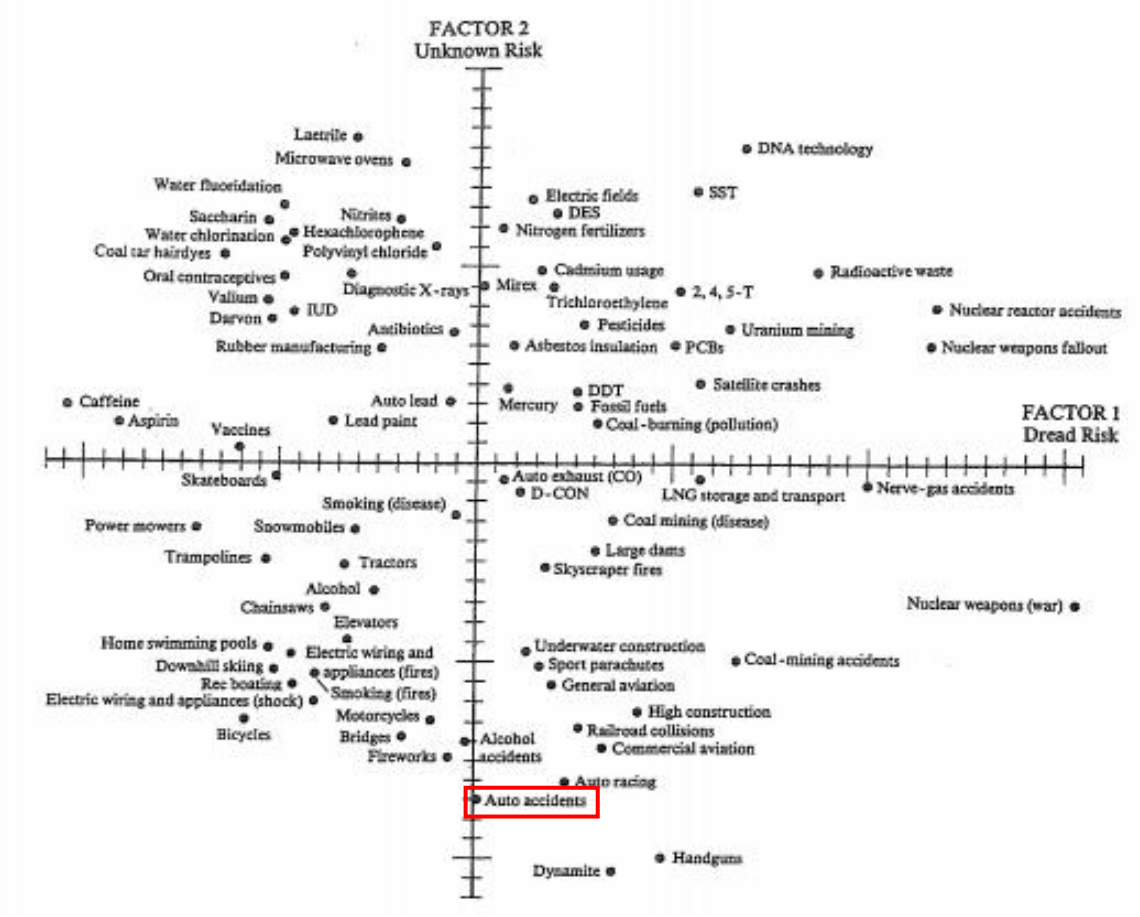

Figure 3: Chart by Slovic that plots items based on their familiarity and fear (Slovic, 2010, pg. 58)

While looking at the chart, it is clear that "risk perceptions and risk-taking behaviors appear to be determined not only by accident probabilities, annual mortality rates, or mean losses of life expectancy but also by other characteristics of hazards such as uncertainty, controllability, catastrophic potential, equity, and threat to future generations" (Slovic, 2010, pg. 62).

The biggest problem when it pertains to cars and speeding is that in all decisions pertaining to risks there are "experts and lay people having different definitions of the concept" (Slovic, 2010, pg. 59). Diving deeper into this, people who have never been in a car accident or only had minor accidents will not view speeding as having a large risk because they do not have the experience and potential trauma to warn them of the danger. In contrast, those that have been

in multiple accidents or had one major collision know the consequences and added risk created from speeding. This can be directly tied to Slovic's Accidents as Signals portion of *Beyond Numbers: A Broader Perspective on Risk Perception and Risk Communication*. In this section, he discusses how "the impacts of [unfortunate] events sometimes extend far beyond these direct harms and may include significant indirect costs (both monetary and nonmonetary)" (Slovic, 2010, pg. 59). The example that Slovic (2010) uses is the accident at Three Mile Island. This was a highly publicized incident of a nuclear meltdown, which led the power plant to be evacuated. Although there were no serious injuries or deaths involved, it sparked greater restrictions on nuclear energy and an increase of the public's distrust in the industry (pg. 60).

Applying Slovic's Framework to Drivers

When drivers are late for work, or they want to feel an adrenaline rush, they will speed down the road putting themselves and others at risk (Curtis, 2020, Why do People Speed?). However, when these types of speeding occur, they do not consider what can happen to others, they only think about what will happen to themselves. Slovic (2010) shows that those who speed are willing to accept these risks, but they do not put themselves in the other person's position. If these drivers would invoke moral imagination, they would understand that this is not the right thing to do. Moral imagination is "an imaginative process essential not only to understanding the sentiments of others but also to moral judgement" (Heath, 2016, n.p.). Using this process and combining it with Slovic's risk perception, people would consider the risks not only to themselves, but also others around them. Applied to speeding, it would give driver's an extra incentive not to speed, because they are protecting themselves and others at the same time.

Part III: Approaching New Educational Methods

Although it is impossible to remove speeding entirely, there has not been an effective effort to try and convince drivers that reducing their speed is the responsible thing to do. Using Slovic's Risk Perception chart (Figure 3), it is clear that people do not believe that car accidents are a severe problem. If they did, the dread risk would be higher to demonstrate that they would take the necessary precautions to ensure that it did not occur to them. When comparing to auto accidents, it is surprising to see how many more events are more dreaded, such as mercury. Although mercury is very dangerous, it is virtually nonexistent in everyday life, however, driving and speeding or seeing someone speed happens on an everyday basis. Another main concept mentioned by Slovic is that "People's Perceptions of Risk are Sometimes Inaccurate" (Slovic, 2010, pg. 50). When looking at Table 1, one would think that motor vehicles are not nearly as dangerous as all of these other events/items, but this would be false. Although the annual fatality rates per 100,000 people are more for motorcycling, coal mining, and hang gliding, this makes up a much smaller portion of the population. When comparing these three events to driving a car, the number of people that can be affected from the persons actions are significantly smaller.

Table 1: The number of people at risk out of every 100,000 people (Slovic, 2010, pg. 53)

Risk	Rate
Motorcycling	2000
Aerial acrobatics (planes)	500
Smoking (all causes)	300
Sport parachuting	200
Smoking (cancer)	120
Firefighting	80
Hang gliding	80
Coal mining	63
Farming	36
Motor vehicles	24
Police work (nonclerical)	22
Boating	5
Rodeo performer	3
Hunting	3
Fires	2.8
1 diet drink/day (saccharin)	1.0
4 T. peanut butter/day (aflatoxin)	0.8
Floods	0.06
Lightning	0.05
Meteorite	0.000006

Problems with the USDOT's Current Solution

The US Department of Transportation created a Speed Management Program Plan (2014) to try and reduce the number of speeding violations across the US. The USDOT (pg. 10) reported that "speed is linked to the probability of being in a crash, although the evidence is not as compelling because a crash is a complex event that seldom can be attributed to a single factor." This complicates the issue because it is hard to pinpoint exactly how many car accidents are a result of speeding. However, it is likely that the number would be higher rather than lower because the faster you drive, the more likely you are to be in a car accident (pg. 10). They also reported that a reason many drivers still feel that it is acceptable to speed is due to inconsistent law enforcement on speeding (pg. 11). This means that law enforcement does not have a set limit on when they should pull somebody over. For example, most drivers believe that they can go up to 10 mph over the speed limit before they get pulled over (pg. 11). Without having this set limit to pull people over, people are less likely to recognize the additional risk associated with speeding.

Looking at the USDOT report in their Speed Management Program Plan (2014), and what Slovic was describing in Perceiving and Communicating Risk Evidence (2010) a connection can be made. The USDOT states that "coordination among enforcement, engineering, education, and research and data components are critical to the development and evolution of effective speed management strategies" (pg. 11). A key part of this statement is the education for the drivers. If the drivers do not get educated on the risks of driving over the speed limit and change their perception, there is a very limited number of things that can be done to reduce the amount of speeding. The USDOT plans to put more of an emphasis on teaching drivers about the dangers of speeding than the current method of enforcement (pg. 28). However, Slovic

(2010) explains that giving a list of statistics explaining the consequences of speeding are more likely to scare drivers than make actual, meaningful impact (pg. 50). Using Slovic's system, we can develop a better way to educate drivers instead of having the USDOT give all of the statistics on the dangers of speeding to drivers and hope they make the right decision.

By using both Slovic's Risk Perception and the USDOT's Speed Management Program Plan, a course of action to help reduce the number of speeding drivers, which will reduce the number of deadly car accidents, can be mapped out. In Slovic's Strong Beliefs are Hard to Modify (pg. 51) section, he states that "new evidence will appear reliable and informative if it is consistent with one's initial beliefs, and conversely, contrary evidence will be dismissed as unreliable, erroneous, or unrepresentative." This tells us that aiming to change every person's mind on speeding would be too large of a task due to the nature of people to reject information that does not reaffirm their original opinion. Additionally, it shows that the transition will not be immediate. Drivers will process the information and not fully understand the meaning until there is a sudden shift in their mindset that makes them see the dangers and cause them to obey the speed limit.

One of the many other ways that people's perception of risk can vary is dependent on what they see or hear in the news. With the very limited amount of media coverage on how many car accidents and deaths that occur due to speeding, people are less likely to view it as a serious risk. In contrast, an event that is statistically not very likely to happen is a shark attack. However, with any shark attack in the US there are multiple reports about how and where it happened. In the past 184 years there have been only 1,508 shark attacks, less than 8 attacks per year (Florida Museum, 2018, US (All)). From 1976 to 2019, there have been 1,875,082 deaths from auto

accidents (IIHS, 2019, Trends). Even though being attacked by a shark is much less likely to happen, people still fear it more than a deadly car accident.

Ways to Improve the USDOT's Current Solution

One thing that all of the research on risk perception by Slovic and statistical studies by USDOT fails to consider is human compassion. In the USDOT's report from 2014 they mention the use of creative materials and concepts. When using the word creative, they are being vague and implying that everyone is the same and they only need one idea to get their point across. However, instead of using this creative approach and the current consequential method, a focus on human emotion and being ethical should be used. By having drivers consider the fact that serious accidents not only harm themselves, but other drivers on the road, people would no longer feel as though speeding only impacts them. With the current system, drivers believe that by speeding the worst thing that can happen is they get caught by a police officer and have to pay a fine, when in reality the consequences are much worse. The approach of teaching drivers to use moral imagination would take away the belief that speeding can only harm the person doing it and shift the driver's thoughts to those around them.

Conclusion

When looking at the decisions people make while driving, it is clear that speeding is a very common choice. Regardless of the reason behind the speeding, it is too easy to fail to see the dangers that it poses to all on the roads. The current solution of having consequences for drivers' actions is not working and new techniques need to be implemented. Through the use of Slovic's Risk Perception, drivers can be better educated about the dangers of speeding. By teaching drivers to use moral imagination, they can be shown that their actions have

consequences, not only for themselves but for those around them. Although not everyone will be willing to accept this new method of thinking, those that do will be saving lives on a daily basis.

The approach of using ethics instead of scare tactics has not been used in the past but poses a promising solution. This new approach will connect not only to those that already see it as a problem, but to drivers who feel that speeding has no effect on safety. Simply stating facts, like 26% of deadly crashes occurred when a driver was speeding, do not stick with a driver (NHTSA, 2018, pg. 2). Having them put themselves in another person's shoes is the best way of showing how serious the problem really is. Therefore, invoking moral imagination is a superior method to the current approach at convincing drivers they need to slow down.

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