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Acknowledgement

This thesis marks the end of a two-year program within risk analysis and governance. Throughout the program we have had a wide variety of courses covering topics like crises communication, terror and resilience and economic analysis decisions in risk management.

A common thread with the courses is getting a better and broader understanding of the theoretical and practical elements involved in risk governance.

The process of writing this thesis has been a long and educational one. Sourcing information about the campaigns took longer than expected, and in the end the provided information was of less use than anticipated.

Many thanks to professor Eirik Bjorheim Abrahamsen provided valuable guidance in the initiation phase. In hindcast I see that better front loading of my writing process would have enabled better use of his expertise.

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List of abbreviations

DRM	- The Didactic Relation Model
ELM	- Elaboration-Likelihood Model
HBM	- Health Belief Model
H-Index	- Number of articles (n) with more than (n) citations
I ₁₀ - Index	- Number of articles above (in this case 10) citations
NPRA	- The Norwegian Public Roads Administration
NCRA	- The Norwegian Council for Road Safety
OECD	- Organization for Economic Co-operation and Development
TBC	- Theories of behaviour change
TIB	- Theory of Interpersonal Behaviour
TMC	- The Transtheoretical Model of Change
TRA	- Theory of Reasoned Action
TPB	- Theory of Planned Behaviour
TØI	- Institute of Transport Economics
TSR	- Theory of Self-Regulation

Abstract

Traffic accidents have a significant cost, both for the individual and the Norwegian society. As such, the society has strong incentives to reduce the number of traffic incidents.

Many measures are used to reduce the number of traffic accidents, among the measures with the lowest cost are traffic safety campaigns (citizen awareness campaigns).

In this thesis I have made a review of the last decades larger Norwegian safety campaign with focus on their use of behavioural change theories. I started by a literature search to identify the behavioural theories that are most frequently referenced in traffic safety research. The next step was to evaluate to what extent the larger campaigns incorporate elements from the risk perception/communication literature. To be more precise, the campaigns were analyzed with focus on their use of behaviour change theories.

In all the campaigns reviewed we see examples of the use of elements from risk perception literature. This is as expected since both sponsors of the campaigns, The Norwegian Public Roads Administration and The Norwegian Council for Road Safety, are making use of scientific principles/methods in their preparation and evaluation of the campaign.

Introduction

Traffic accidents have significant cost, both for the individual and the society. The accidents have several negative effects like emotional damages, physical injuries, property damage and financial losses. The economic cost of traffic accidents for the Norwegian society was in 2022 estimated OECD to be 17 BNOK (OECD, 2022)

Due to the negative effects, the Norwegian society has strong incentives to reduce the number of traffic incidents. An important milestone in this work is the “Vision Zero” that was approved by the Norwegian Parliament in 2002. It states that deaths and injuries from traffic accidents are preventable, therefore not acceptable.

The government’s main vehicle for achieving this vision is the Norwegian Public Road Administration, which since the late 70’s has had a separate department that focus on road safety. Different tools and means are used to achieve the main objective of “Vision Zero”, among them are citizen awareness campaigns.

These campaigns use several measures used in traditional commercial campaigns. Prior to this review, it was less clear to the author to what extent the campaigns incorporate elements from risk perception/ communication literature.

Purpose, background, and limitations

It appears that most evaluation of safety campaigns make use of traditional advertising evaluations tools and methods when measuring the effect of the campaigns.

Further, for the evaluation of individual road safety campaigns, it is often quite difficult to isolate the effects of the campaign component from the effects of the measures the campaign is combined with.

It is also rare to see direct comparison/evaluations to risk perception/ communication literature in the campaign evaluations.

Starting hypotheses: Norwegian traffic safety campaigns do not (fully) utilize the theoretical elements in risk perception/communication literature, and there may be room for recommendation of enhancements to future safety campaigns based on risk theory.

Selection of campaigns

In my review I selected the largest Norwegian traffic safety campaign that has been running nationwide over the last 10 years. The larger campaigns were more consistently planned, executed, and documented, than smaller local campaigns.

Theory

Norwegian drivers must follow a well-defined set of traffic rules. Before being allowed to drive a vehicle the prospective driver need to study the rule book, complete mandatory driving training, and pass both a written and a practical exam. Still, even after this strict qualification requirement we see that many drivers do not follow the rules they learned during training. Some of the errors made by drivers are unintended, while other are performed while the driver understood they did not follow the rules (Gregersen, 2016). We will look closer at these aspects in relation to common models for predicting and changing human behaviour.

The next sections describe the most common theories and models for predicting human behaviour and changes in behaviour. Many of the listed theories dates several decades back in time, some has been replaced by enhanced theories while others still are used. The theories are still central in describing how motivational campaigns like traffic safety campaigns works. Elements from the models may be used as guide prior to the campaign, when designing campaign and during or after the campaign when the results should be evaluated (Statens Vegvesen, 2022).

Theories of behaviour change

One of the pioneers in research on human personality was Gordon W. Allport. In his lectures at Harvard, he promoted the empirical methodology that considered “the influences of current context and conscious motivations, without dismissing the possible contribution of unconscious memories and/or mechanisms to human thought and behaviour” (Allport, 1935). Said in other words our personality and views are shaped more by the present context than our experience. Allport’s theories were of interest for a wide audience, but for safety campaign that were other aspects of psychologig research that later became more central.

Several theories have over the years focused on predicting and explaining behaviour change. The theories often use a set of definitions together with process flows to describe the effect on individuals.

In the below discussions we will frequently refer to the following definitions:

Beliefs:	Ideas you hold to be true
Normative beliefs:	Your expectations of how others, that that you have respect/value, would react to your behaviour
Values:	What is important to you
Attitude:	How you view others and how you approach situations
Behaviour:	How you end up acting

Among the most quoted theories in behavioural science were:

Theory of Reasoned Action

The Theory of Reasoned Action suggests that people’s intentions to behave in a certain way are based on a set of “weighted beliefs about the consequences of such behaviour” (Ajzen & Fishbein, Belief, attitude, intention and behaviour: An introduction to theory and research, 1975). Said in another way an individual's decision to behave in a particular way is based on the outcomes the individual expects will come because of performing a certain action. This theory assumes that people make logical and consistent decisions, and that attitude and social pressure (“social normative beliefs”) are factors that impact intentions.

Among the basis for the theory are the simplification that “attitude could be viewed as a one-dimensional disposition for establishing positive or negative views”. How strong a person’s views are for a certain topic, will based on TRA then be determined by which “subjective attributes are linked to the topic” and how strong the combination of these beliefs are (Ajzen & Fishbein, Belief, attitude, intention and behaviour: An introduction to theory and research, 1975).

There are two major inputs into the model (see Figure 2):

- a. Attitudes towards the behaviour, determined by the beliefs about behavioural consequences and an evaluation of these
- b. Subjective norms: determined by the normative beliefs (I.e., beliefs about how other would react to the planned behaviour) and the motivation to comply with these norms defined by others

Beliefs about behaviour consequences and the evaluation of these consequences influence attitudes towards the behaviour. Normative beliefs (beliefs about others with respect to performing the behaviour) and the individual’s motivation to comply with those normative beliefs predict subjective norms.

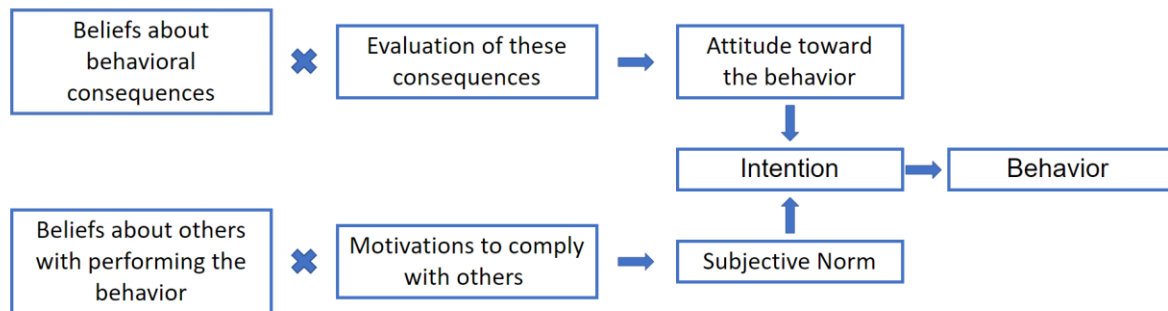


Figure 1. Theory of Reasoned Action

An example of the application of this model will be the individual’s evaluation of whether to use a seat belt or not. The attitude towards wearing the seatbelt will depend on the individual’s evaluation of the potential consequences of not wearing a seat belt. Their intention to wear a seat belt would also be impacted of the actual or perceived expectations from the community (family, neighbors, peers) through the subjective norms (i.e., the individuals desire to be accepted for one’s choices).

Fishbein initially tested his model in the US on people’s views and attitudes towards African Americans. (Ajzen, Martin Fishbein’s Legacy: The Reasoned Action Approach, 2012) His survey was performed in two steps. He started with a free format survey, which he used to gather a collection of attributes that the participants assigned to African Americans. The most used attributes in the initial survey were then used in a second survey where the alternatives were graded, seeking to identify how strong the persons belief were in each of the attributes. When aggregating these results and comparing them to a direct attitude measure, the indirect measurement by aggregating the strength of views in each attribute Fishbein found a strong correlation. Subsequent tests using the same process measuring attitude, provided similar results (Ajzen, Martin Fishbein’s Legacy: The Reasoned Action Approach, 2012).

Fishbein states in his report that the process of establishing views is not always rational. Humans tends to be selective when evaluating facts, choosing information or observations that strengthen

their existing views. These views, or “set of beliefs” that are accessible in the individual’s memory, provides the cognitive foundation from which attitudes later are consistently created. Fishbein’s theory was widely acknowledged but also challenged by several scholars who found it to be limited in scope. Eventually, also Martin Fishbein himself saw the weaknesses with the TRA (Ajzen, Martin Fishbein’s Legacy: The Reasoned Action Approach, 2012) , in particular the limitation that behaviour would be controlled and decided mainly by the individual. As such, the model did not fully reflect that behaviour is strongly influenced by outside factors and the social nature of humans.

Already in 1934 Richard LaPiere had demonstrated the discrepancy between what people say and what they do (LaPiere, 1934). LaPiere made an extensive study where he monitored how a Chinese couple traveling in the US was received when visiting restaurants and hotels. The actual behaviour of staff in restaurants and hotels during the visit was then compared to written replies that he received when contacting the restaurants and hotels by mail. As a background it is worth noting that at the time there were strong anti-Chinese sentiment in the US due to the increasing immigrations from China. LaPiere concluded in his paper (LaPiere, 1934), that he found no correlation between the replies found in the written response (i.e., letters) and the actual behaviour experienced when visiting the restaurants and hotels. In fact, the actual behaviour was in most cases better than the written response to his inquiries.

Acknowledging the weaknesses in the TRA, Fishbein together with Icek Ajzen, one of his students, started work to improve the TRA and the result was the Theory of Planned Behaviour (TPB).

Theory of Planned Behaviour

The Theory of Planned Behaviour (TPB) builds on the TRA, but expands the theory with perceived behavioural control as a factor in deciding and predicting the intentions. (Ajzen , From Intentions to Actions: A Theory of Planned Behavior, 1985)] In other words the model adds a factor to TRA which could be used to explain behaviour also in cases where the individual themselves feels they have limited direct control over their actions.

When defining a behaviour that should be monitored, the TPB analyses the element of the behaviour with respect to target, action, context, and time frame. Each of these four elements impacts the behaviour and needs to be defined for the TPB to be used in predicting behaviours.

In both the theory of reasoned action and the theory of planned behaviour the individual’s intention to perform a given behaviour is central. Intentions in this context describes the motivational factors that influence a behaviour. The intentions could be seen as indications of how much effort a person is willing to mobilize to perform a given behaviour. As stated earlier, the stronger these intentions are, the more likely is the actual behaviour.

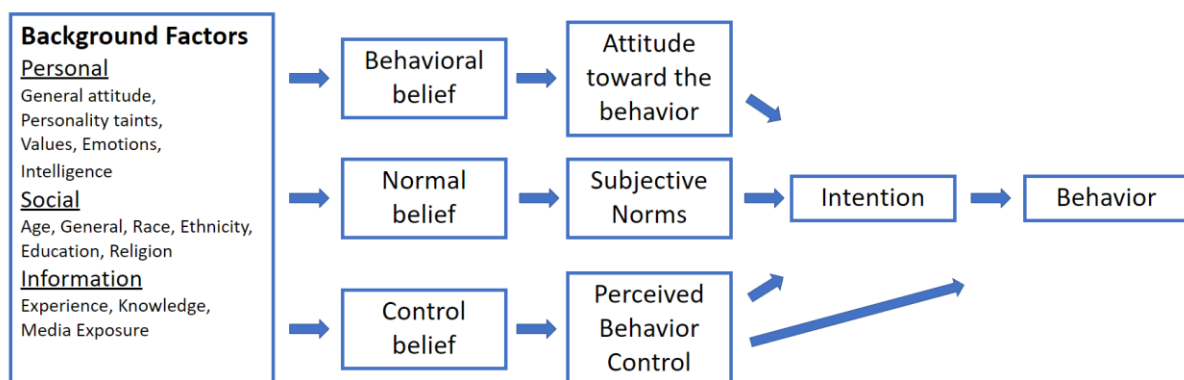


Figure 2. Theory of planned behaviour, (Ajzen 2005)

It is worth noting that outside factors like skills, time, and financial resources, may also impact the actual behaviour. The action in most cases depends on some degree of such non-motivational factors.

If we transfer this to a traffic situation, the perceived behavioural control refers to outside factors like road conditions, weather and the cars capabilities that impacts people's perception of how difficult is to perform a certain behaviour.

At about the same time that Fishbein published the TRA, Harry Triandis published the Theory of Interpersonal Behaviour which coexisted with the TRA and TPB.

Theory of Interpersonal Behaviour

The Theory of Interpersonal Behaviour (TIB) has many similarities to the TPB. The TIB includes the belief of the outcome, perceived social pressure that impacts the individual intentions which again influence the behaviour. (Triandis, 1977). However, the TIB supplements the TPB with habits as an additional factor that can help predict behaviour. Habits in TIB refers to the mechanisms where the individual select the behaviour through a process involving minimal of thinking since the activity has been performed multiple times before.

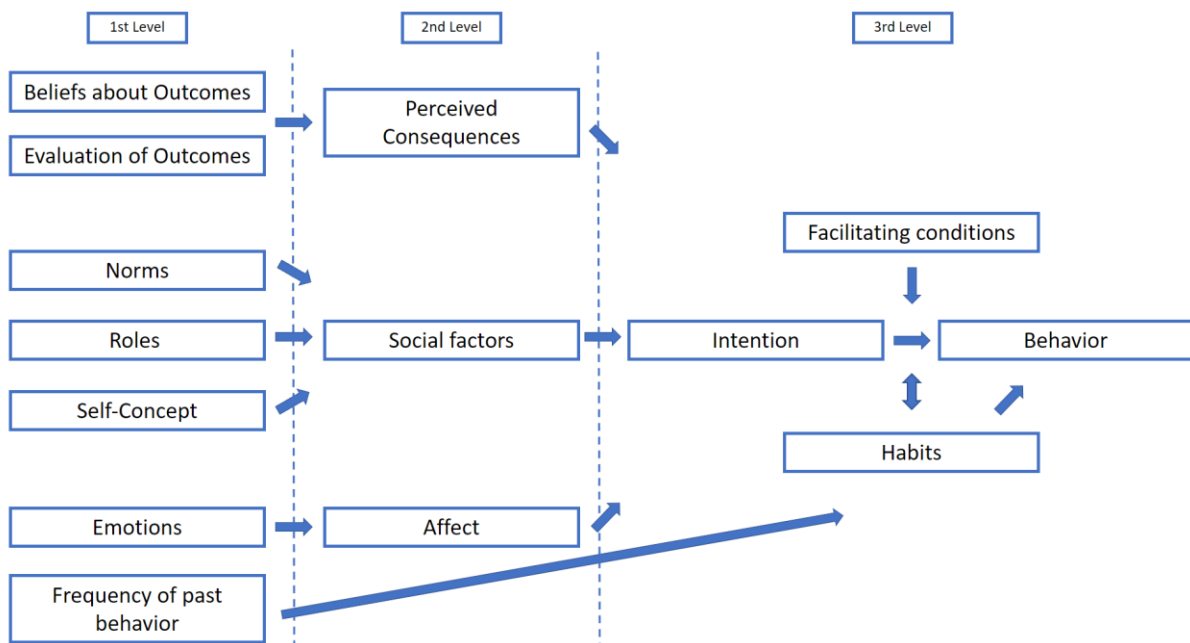


Figure 3. Theory of Interpersonal Behavior (Triandis, 1977)

The theory of Interpersonal Behaviour could be used to describe and evaluate campaigns that are targeting behavioural changes, in particular campaigns that are targeting changes to habits. In this case the campaigns will have limited effect if they only focus on changing the intentions of the individual. This is because when an action has become a habit the individuals do not spend much time on evaluating his actions, because the action is already justified through multiple previous experiences.

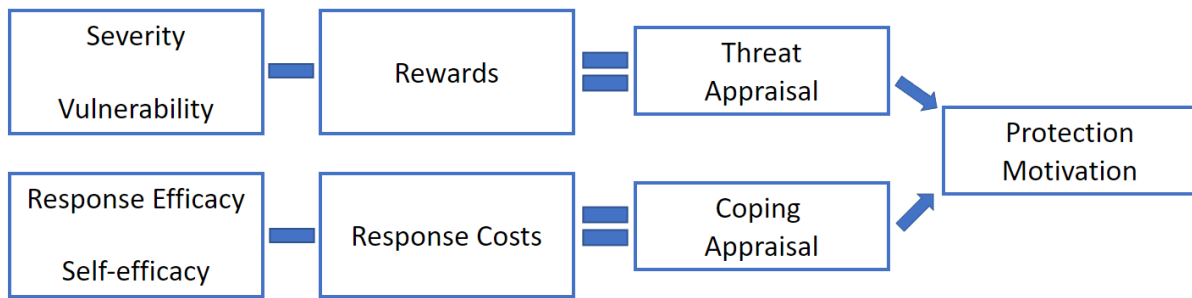


Figure 5. The Protection Motivation Theory (Rogers, 1975)

Theories describing the persuasion and behaviour change processes

The main purposes with traffic safety campaigns are to persuade drivers to adopt new attitudes or behaviours. A set of theories has been developed to explain the persuasion and behavioural change processes.

Elaboration-Likelihood Model

The Elaboration-Likelihood Model of persuasion (ELM) is a model that “describes a dual process describing how individuals can be persuaded to change their attitude” (Petty & Cacioppo, 1986). The two processes, a “central” and “peripheral” route to persuasion is different in how much processing or evaluation the individual does of the messages. Communication through the central route requires the individual to be highly motivated to process the message, often through previous knowledge to the subject. If the individual relates to the message in a positive way, the individual may put more energy/involvement into the processing of the message. If the message triggers the individual that may change his belief and attitude towards the topic, which in the end may change the behaviour.

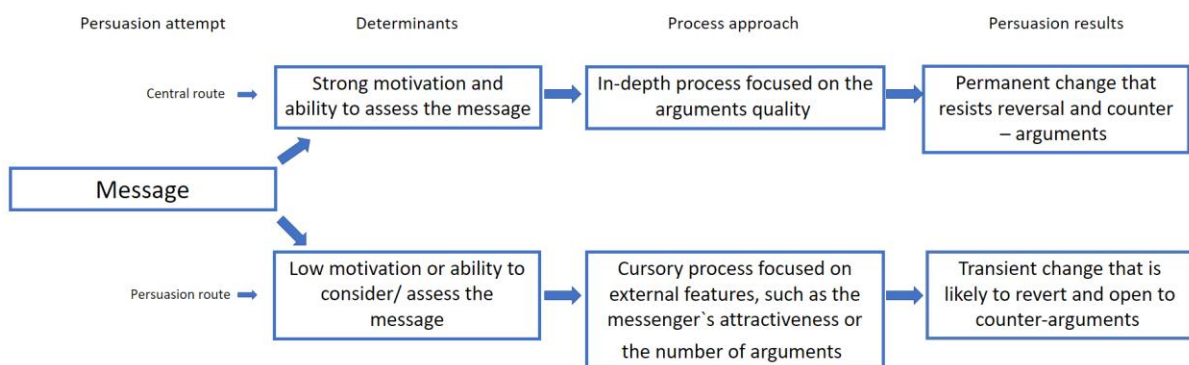


Figure 7. The Elaboration-Likelihood Model

The alternative route is through the “Peripheral route”, where the individual gets less involved in the processing of the message. For the individual to get persuaded through this route there must be other factors than the content of the message that makes them respond. These factors could be message conveyed by someone you like or respect, or the packaging of the message.

ELM postulates that the central route, that involves more thinking and processing, are more likely to persist over time and influence behaviour.

Theory of Self-Regulation

The Theory of Self-Regulation (TSR) (Carver & Scheier, 1981), describes the way in which individuals change their behaviour based on the concept of negative feedback. The individual begins by comparing one-selves to a standard or a set goal. If there are any deviations between begin the current situation and the goal one start to make changes or adapt to better comply. The feedback loop could continue with new comparison and further adaptation towards goal attainment or adjustment of the goal. The outcome of the process could also be that the goal is abandoned.

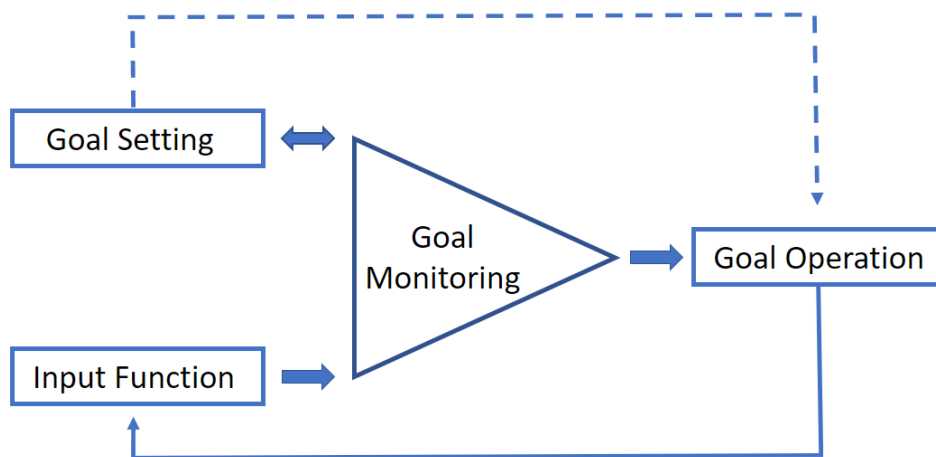


Figure 8. Theory of self-regulation

In the case of traffic safety campaigns, the mechanism of TSR may be used when the campaign encourages the individual to establish a virtual goal of safe behaviour. It could be a goal of always putting on the safety belt prior to starting the car, with the encouragement to evaluate at regular intervals if you follow this practice.

The Transtheoretical Model of Change

The Transtheoretical Model of Change (TMC), developed by (Prochaska & DiClemente, 1981), is a model that divides the process of behaviour change into stages. The change process is divided into six steps or stages from a situation where the individual does not even think of a change until a situation where the individual has completed the change and made it permanent. Viewing the change in stages may be beneficial when one plan a campaign to achieve a change in behaviour. The stages of the TMC model are:

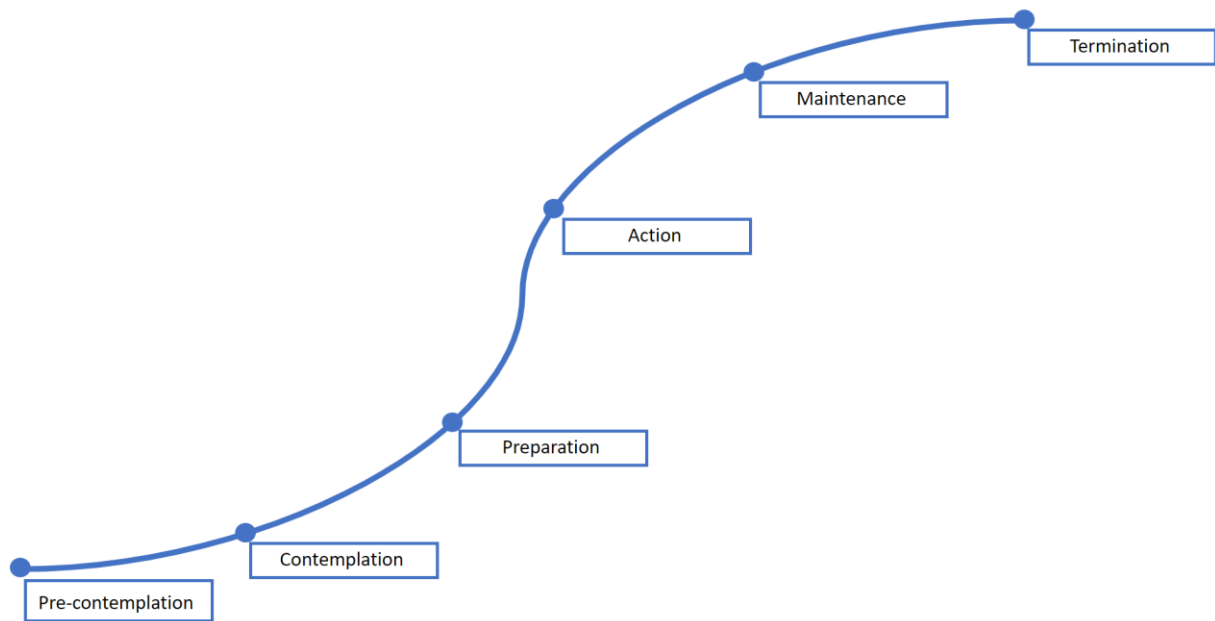


Figure 6. Six Stages of Behaviour Change Model (Reed, 2001)

- Pre-contemplation – The individual does not consider a change and has no intention to change behaviour.
- Contemplation – The individual is aware of the problem with current behaviour, but costs and benefits associated with the behaviour are viewed to be about equal.
- Preparation – The intention to make an action involving a change is high and the first changes reducing the problem behaviour may have occurred.
- Action – Some change in behaviour has occurred but the individual feels that the change requires much effort. This is the most unstable stage with a high risk of the individual returning to the old behaviour.
- Maintenance – The new behaviour has started to become habitual but still a chance of fallback to earlier behaviour. The individual need to feel that the new behaviour is rewarding.
- Termination – The new behaviour is established and there is no longer any wish to return to the former behaviour.

There are some characteristics elements associated with specific TCM stages that have implications for mass media campaigns. In the pre-contemplation stage, the individuals are not aware that they are engaging in a problem behaviour. Only informing a person about the disadvantages of their behaviour will therefore not have the desired effect since the evaluation of the messages is highly dependent on the receiver's own underlying beliefs. People in this stage are also more difficult to reach since they do not actively seek information.

It is worth noting that even though it in general is difficult to reach someone at a pre-contemplation stage, some health researchers have reported positive results when proactively seeking and contacting pre-contemplators (Reed, 2001).

To progress to the next level, the contemplation stage, individuals need to become aware of their problem behaviour and what is required do avoid/change the behaviour. One way of achieving this,

used by safety campaigns, is to highlight the conflict between the individuals needs and those needs of the public, which may result in cognitive dissonance, dissatisfaction, and a desire to change.

Once at the contemplation stage, individuals are often more open and receptive to new information, and they may want to learn more.

Progression to the next stage may happen if the message is seen as functionally relevant or the individual experience pressure from others in the community (DeBono, 1987) .

The TMC has a high focus on the readiness of a person to change. By adapting the communication to the persons degree of readiness the chance of initiating a change process and lifting them to the next level increases. Knowing at which stage most of the target audience are, will therefore be very useful when developing the strategies for road safety campaigns.

The Didactic Relation Model

Many of the Norwegian traffic safety campaigns contains elements of educating the public. There are many theoretical models that describes the mechanism involved in teaching and learning. However, in Norway the “Didactical Relationship Model” developed by Hiim and Hippe has evolved to be central in teacher education and learning research.

The model shows the relationship between the different elements that are relevant in a learning situation. The model focus on six elements and how they relate to each other, interact, and impact the ability to learn.

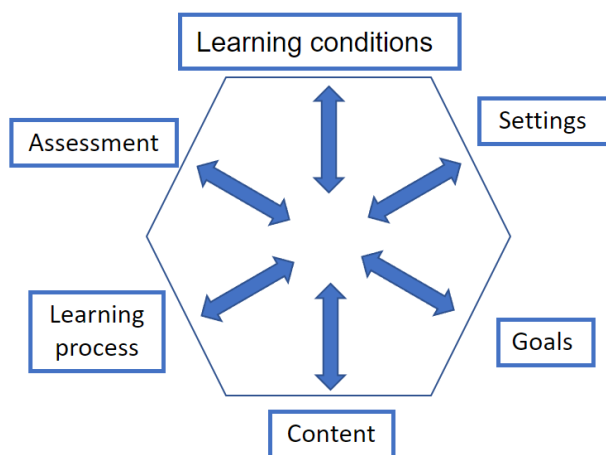


Figure 7. The Didactical Relationship Model by Hiim & Hippe (2001)

The six points, when adapted to traffic campaigns, are:

- a. Learning conditions - Focusing on the individuals backgrounds, believes, experiences and interest.
- b. Settings - What is the arenas where one reach/get in contact with the individual
- c. Goals – What do one want to achieve with the interaction (or campaign). What is the desired result?
- d. Content – How is the messages packaged and presented, what do the target group know about the topic
- e. Learning Process – Which communication methods are most effective for the planned messages
- f. Assessment -Evaluation of the (interim) results of the campaigns

Traffic safety campaigns in Norway

In this thesis I have used the seven largest recent Norwegian traffic safety campaigns as the basis for my analysis and outlined their goals, target groups, campaign structure and the application of risk communication theory in the campaigns.

Campaign	Year
Follow the Speed limit	2020 - 2024
Thank you for paying attention	2018 - 2022
Better interaction / Better Collaboration	2013 - 2018
Share the road	2013 - 2019
Not cool to be dead	1987 -
Which side of the speed limit are you on	2009 - 2012
Remember seatbelts	2015 - 2020

Figure 8. List of evaluated campaigns

Most larger traffic safety campaigns in Norway are financed by the government, thru The Norwegian Council for Road Safety or the Public Roads Administration (NPRA), with NPRA being responsible for conducting most of the campaigns.

The Norwegian Council for Road Safety

The Norwegian Council for Road Safety is a membership organization that works to improve traffic safety. Among the members are the larger cities in Norway together with associations that work with traffic related issues. NCRS was established in 1956 as an initiative from the automobile associations and the Norwegian Government.

The organization's goal has since 1956 been to promote the safest possible use of roads and sidewalks. While they work for better safety for everyone, their main activity has been teaching children in kindergarten and elementary school safe traffic behaviour. They have different programs for different age groups.

They are organized with a central administration that cover the larger national campaigns and smaller local branch offices around the country that facilitates both the larger local campaigns and smaller local campaigns that are optimized for the local communities. (Norwegian Council for Road Safety, 2022)

Norwegian Public Roads Administration

The purpose of Norwegian Public Roads Administration is to "develop efficient road systems that are accessible to all, and where transport does not cause serious damage to people or the environment". (NPRA, 2022) Among their roles are to develop the specifications and standards for how new road are supposed to be built.

NPRA work on the behalf of Ministry of Transportation and oversee the day-to-day operations of the road network in Norway. As a part of their mission to reduce accidents, they also fund and conduct different traffic safety campaigns.

Financing

The financing of the NPRA campaigns is 100% from the Government, while The Norwegian Council for Road Safety receives most of their funding from the Government, supplemented with grants from insurance companies, supplemented with profit from sales from their online safety shop. NCRS also receives funds from local governments and companies for certain local campaigns.

To illustrate the campaign expenditure/size, the campaign “what side of the speed limit are you on” spent a little over 40 million NOK on advertisement, making the budget for the campaign around 50 mil NOK. (Institute of Transport Economics, 2022). In this case the campaign that lasted 3-4 years. The Public Roads Administration has the last few years run 2-3 campaigns in parallel.

In addition to the above actors, there are some smaller organizations which runs local campaigns, sponsored by local governments or private actors.

Follow the speed limit

Goal of the campaign

The overall goal of the campaign is to reduce the number of drivers that drive above the speed limit, with a focus on those that drive just a little over the speed limit believing that most other drivers are also driving above the speed limit. (Statens vegvesen, 2022)

Actual speed

Publics driving habits are continually monitored and registered. The monitoring is done at 50 different locations with speed limits ranging from 50 –110 km/t (Statens Vegvesen, 2021). Data collected from the sensors gives a picture of peoples speeding habits.

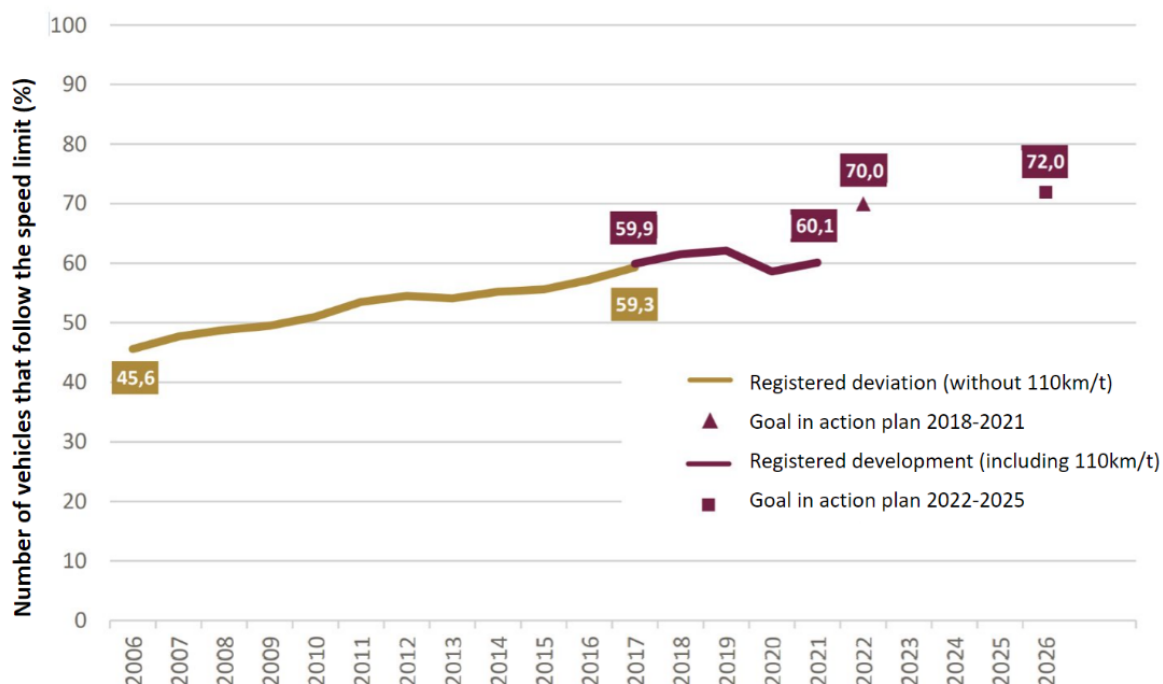


Figure 9. Drivers following the speed limit over time

The figure above shows the percentage of drivers following the speed limit over time. Over the last 15+ years there has been an 30% increase in the number of drivers that follow the speed limit.

Target group

The Norwegian Public Roads Administration surveys shows that drivers believe other drivers break the speed limit more than shown by measurements. This assumption about other drivers is used as justification for themselves driving above the speed limit. The target group for the campaign is this group of drivers that regularly drive above the speed limit, using other drivers as their justification.



Figure 10. Follow the speed limit (Statens vegvesen, 2022)

The campaign is targeted towards a certain demographic, but the messaging in the campaign applies to all drivers. (Statens vegvesen, 2022)

Campaign structure

The Norwegian Public Roads Administration maintain their own web page for the campaign, where reader can get information about how many that drive over the speed limit, tips for how to avoid driving over the speed limit both knowingly and unknowingly as well as debunking some common misunderstandings around driving just a little bit over the speed limit.

As of April 2022, two commercials covering the topic that have been shown on both on linear tv as well as on the internet. The first movie showing the potential consequences of driving just a little over the speed limit, while the second movie reminds people that most drivers follow the speed limits. (Statens vegvesen, 2022)

Risk communication elements used in the campaign

The campaign has a dual message and structure. Firstly, the campaign is taught drivers about how few people that drive over the speed limit, using social pressure to hopefully get more people to follow the speed limit. Secondly, it informs about the risks involved when driving a little over the speed limit, using graphic representations like the one below to show the large difference in braking length when driving speed is increased as little as 10 kilometers pr hour.

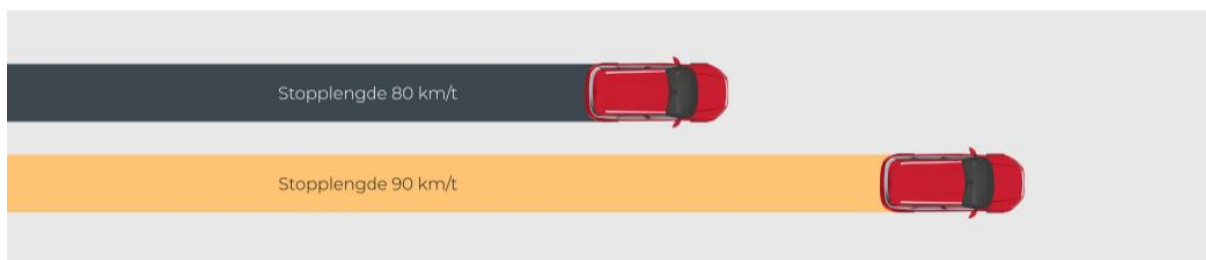


Figure 11. Breaking distance visualization (NPRA 2022)

Evaluation of the campaign

Evaluation of the campaign has not started as of writing this thesis.

Thank you for paying attention

Goal of the campaign

The campaign's goal is to make drivers more alert and aware of their surroundings. The campaign work both directly, by trying to change drivers' habits to make them more alert when driving, and indirectly by making the drivers more aware of common distractions that typically goes undetected.

The background for this goal, is that about a third of all traffic accidents are directly or indirectly related to the driver being distracted by something or someone else when operating the vehicle. Therefore, increasing awareness and avoiding distractions when driving would be an important step towards the vision zero goal that the Norwegian Roads Administration promotes. (Statens vegvesen, 2022)

Target group

The target groups of the campaign include all drivers, divided into two sub-groups. One group consisting of those that are knowingly being distracted while driving and the other group includes those who are distracted but are not aware of this themselves.



Figure 12. Campaign messaging (Statens vegvesen, 2022)

Campaign structure

In addition to reminding drivers to pay attention while driving, the campaign focused on teaching drivers how distractions affect our attention. The videos also show examples of distraction sources, so that the people observing the campaign can have a better understanding of how potential distractions while driving affect them. The use of cellphones or other electronics are usually the first thing we think about when it comes to distractions while in traffic, but the campaign also makes the recipients aware of other factors that impact our attention like visual and audible distractions and how we think and react. The campaign lasted from 2018 to early 2022.

The campaign consisted of commercials on tv and in movie theaters, had soundbites on radio, consisted of different posts on social media and generated coverage in different newspapers. There were two main statements used in their messaging, the first was bring your head when driving, this was illustrated in posters and in commercials as a headless driver driving. The second part reminding the public that about 30% of accident happen due to the driver not paying attention



Figure 13. Headless driver commercial (Statens vegvesen, 2022)

Risk communication elements used in the campaign

The campaign shows examples of what can distract drivers, and what consequences distraction could lead to. It highlights that element that we don't realize are distracting us, have a larger effect on our concentration that people realize.

Evaluation of the campaign

Since the campaign ended at the time of writing, no evaluations of the campaign had been published yet. But the commercials in the campaign received high remarks at the Global Road Safety Film Festival in 2022 for their messaging, quality, and ability to reach their target audience. (Kreativforum, 2022)

Better interaction / Better Collaboration (Samspill)

The “Collaboration campaign”, that started in 2022, builds on the “Share the road” campaign from 2013 - There more than just cars on the road

Goal of the campaign

All the major urban areas in Norway have a target of reduced use of cars. As a part of the strategy to reach this, the government has decided that all increase in transportation should be by other means than cars, i.e., by walking, bicycling and use of public transport. This would lead to an increase of user groups on the streets, which may lead to conflicts and unsafe conditions. To avoid these conflicts there are a need for a better understanding between the different users of the road. So, the goal of the campaign is to improve the interaction between users of the road. (NPRA, 2022)

A study performed by Institute of Transportation of how road users felt with regards to safety and vulnerability (Karlsen & Bjørnskau, 2020) showed a wide distribution in views between the various users. Bicyclist expressed that they felt vulnerable, when interacting with busses and trucks, while drivers were uncertain when sharing the road with bicycles and E-bikes. The latter was mainly a concern about how the bicyclists and e-bikers behaved in the road and to what extent they were following traffic rules.

The purpose of the campaign is to improve the interaction between all users of the road with focus on the following areas:

- Ensure that you have eye contact with others that are crossing your path
- Make others aware of your intentions by using signs
- Which rules does an e-bike have to follow?
- Who can use the sidewalks?

Target group

The target for the campaign is all users of the road and sidewalks. This includes cars, people using sidewalks and crossing roads, cyclists and e-bikers using both the roadway and sidewalks, pedestrians, and anyone else using the road system or sidewalks.

Campaign structure

The campaign is structured as a series of “be aware of and interact with others”

commercials, covering areas where a lack of communication and interaction has been observed. The campaign could be viewed as a next phase of the “share the road” campaign (2013-2019), which focused on the interaction between cyclist and drivers.



Figure 14. Car meets cyclist meets electric scooter (Karlsen & Bjørnskau, 2020)

Risk communication elements used in the campaign

The campaign focus on how to do things right, rather than the consequences of wrongdoing. By sharing information about best practices, the campaigners try to build on people's good intentions and seek to set up a group pressure to behave in a correct way and that way impact our intentions.

Evaluation of the campaign

Since the campaign started this year (2022), no evaluation formal evaluation reports have been completed. (Statens vegvesen, 2022)

Share the Road

Goal of the campaign

At the start of the campaign, in 2013, the goal was to prevent accidents caused by cars and bikes sharing the road, and to lower the conflict level among some drivers and cyclists. There were two focus areas for the campaign, the first being accident caused by drivers not seeing the cyclists, therefore causing an accident. The second being an increased conflict due to drivers feeling that some cyclists occupy large parts of the road, which again leads to frustration over all cyclists. The campaign was originally supposed to run for 4 years. However, during the first few years of the campaign, not checking blind spots was identified to be a more common problem than first anticipated, therefore the campaign was adjusted and extended by a year.

Target group

The aim of the campaign is to reach all drivers that meet cyclists while driving, with a focus on those that get the most frustrated over having to share the road with cyclists.

Some drivers have become so angry that they forced cyclist off the road and into the ditch resulting for some in needing to visit a hospital (GYNNILD, BLEIKELIA, & FLÅGEN, 2010) (Bjørkli, 2014).

The 2nd target of the campaign are cyclists that actively use the road for commuting. The focus is coexistence on the road, and steps that cyclists can make to make the roads safer for all users. (Høye, Fyhri, & Bjørnskau, 2014)

Campaign structure

The campaign started off with 160 signs (like figure 14 above) located at places where the road was shared by different users. The number of signs was later increased to above 300 due to the positive feedback and measured effect of the initial campaign (Myre, 2022). A total of 17 different commercials were made for TV and other media use, this included both films showing the consequences of not sharing the road and films showing how to share the roadway safer. (NPRA, 2022)

During the first year of the campaign, The Norwegian Public Roads Administration participated at several cycling event to share their messaging, handing out flyers with the learning points. A series of how to safely ride your bike on the road film clips were made featuring Thor Hushovd, former world champion, teaching the audience what to do and share some of the potential consequences of not following these tips. (NPRA, 2022) The last year of the extended campaign, a new set of commercials focusing on blind spots, in particular cyclists being in the blind spots of cars and trucks turning to the right, was added to the scope.

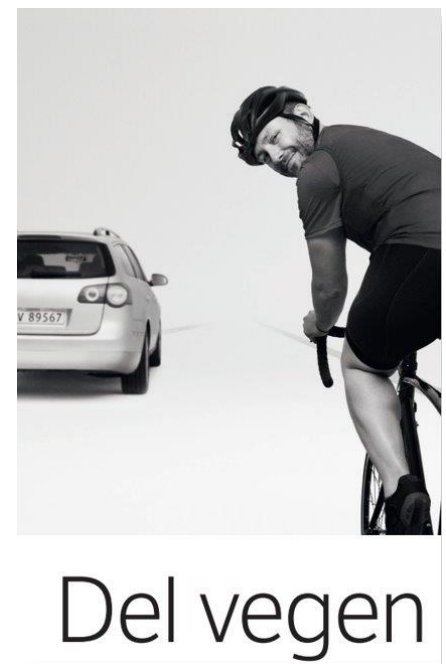


Figure 15. Share the road (Høye, Fyhri, & Bjørnskau, 2014)



Figure 16. Thor Hushovd evading traffic (Myre, 2022)

Risk communication elements used in the campaign

Towards the end of the campaign when blind spots were introduced, there was made a few film clips showing how invisible a cyclist can be for cars and especially trucks. Pushing the point that just because you as a cyclist see the car or truck doesn't necessarily mean that they can see you.

Evaluation of the campaign



Figure 17. Where is a cars blind spots (Nullvisjonen Agder, 2022)

During the evaluation of the campaign, it was found that people felt that their interaction with others had improved during the campaign. Motorist and cyclist achieved better at eye contact with each other in intersections, cars increased their distance to cyclists when passing and cyclists were better at acknowledging that they were in the way and making room for the cars to pass when possible. This led to a lower experienced frustration level between the two parts.

As noted above the campaign started off with 161 signs, and due to their early effect this was increased to more than 300 during the campaign. (Myre, 2022)

After the campaign period was over, the share the road signs were left in place to keep reminding drivers and bicyclists about the importance of being aware of others and actively sharing the road with them.

Not cool to be dead

Since the late 1980s The Norwegian Council for Road Safety has run the campaign “Not Cool to be Dead”. The campaign has made school visits all over Norway.

Goal of the campaign

The overall goal of the campaign is to give future motorists a realistic picture of the potential consequences of making wrong decisions in traffic and to teach the future motorists safe values and habits,

Target group

The target group for the campaign is 9 and 10th graders, because when the students are getting 16 years old many of them are about to start driving light motorcycles/scooters or are starting the process of getting their driver's license. They are also in an age where their choices, habits and values may have very a strong influence on other's behaviour (Moan & Ulleberg, 2007).



Figure 18. The team initiating the campaign (KILNES, 2011)

Campaign structure

The campaigns are split in three parts, a presentation, and student assignments before and after the presentation. The content of the 90-minute presentation changes over time based on the presenter's experience. However, there all the presentation follows a similar main structure, with the main feature being a person that has been involved in a serious traffic accident and survived. They are normally accompanied by a police officer and a representative from NCRS.

The Norwegian Council for Road Safety will typically focus on the importance of safe habits in traffic, while the police will talk about their role and the legal consequences of not following the rules of the road. The person that survived an accident will tell their story, about how they ended up in the accident either by pushing limits or by a miss judgement, and how the accident has affected their and others life after the incident.

Before the presentation, the students complete an assignment in class on how they believe different external factors affect them in traffic, and their perception of being safe in traffic. Following the presentation, they repeat the same exercise to see/demonstrate if their perception has changed. Parts of the surveys are also used evaluate the project.

Risk communication elements used in the campaign

The campaign “Not Cool to be dead” is designed to make use of several of the elements that risk communication theory describes as impacting our choices.

Perceived threat / consequences – Through the vivid presentation from survivor of the accident the students get a reminder that their actions in traffic can have severe consequences for themselves and others. This is reinforced by the police that outlines their reactions to traffic offences.

Groupe pressure – By making the presentation at a larger group, the campaign seeks to impact the entire group, so that they increase the chance of passengers reminding the driver about the accident risks. Giving the students the same reference also lowers the threshold for the students later discussing risk and consequences.

Belief in own skills – The presenter shows how they were too confident in their own driving skills, and links this to the accident. The police reinforced this in their presentation by showing statistics on how young drivers view their own skills and how often they as a group is involved in accidents.

Evaluation of the campaign

The Institute of Transport Economics has made an evaluation of the campaign (Moan & Ulleberg, 2007). In their evaluation they captured views from a large group of the participants and compared the result to those from a control group. To capture views before and after the campaign TØI used survey forms.

The analyses of the results showed that the campaign did impact the students. Most of the group reacted emotionally when exposed to the campaign. Giving the students the opportunity to make and discuss their own evaluations were valuable and helped create a common language/basis for the group.

However, despite the positive feedbacks, the campaign did not show significant changes in the attitudes, intentions, and behaviours among the students.

Which side of the speed limit are you on

Goal of the campaign

The “speed limit campaign” run by the Norwegian Public Roads Administration had several goals:

- Remind “all” drivers to follow the speed limit
- Remind drivers to drive according to the changing road conditions
- Reaching over 80% of drivers with the campaign
- Ensure that more than 50% of drivers know that driving a little bit over the speed limit is more dangerous than they think.
- Make it socially unacceptable to drive over the speed limit

As a bonus they want to make sure that people observing the campaign knew that the sponsors were NPRA and the police.

Target group

The campaign targets the “average driver” who want to drive according to the road regulations and believe that they drive according to the road regulations, with special focus on those that drive just above the speed limit. The media campaign would be targeted men between 25 and 40 years old (Phillips & Sagberg, 2013) The background for the campaign is that most people actually follow the speed limit, while the ones that are speeding believe that the majority of drivers are speeding , and therefore feels less pressure to follow the rules themselves.



Figure 19. Over the speed limit sign

Campaign structure

The main message of the campaign is the consequences of driving a few km/h above the speed limit. The campaign described the limits of what a human can withstand with respect to a crash and educate the audience about how the risk picture changes with increasing speed.

The messages were shared thru commercials both on TV, social media, movie theaters as well as radio stations and different online ads and web activities that user could interact with. There was also posted signs along some roads reminding drives about the campaign. On a few stretches of road, the speed limit was reduced by 10 km/h from 80 to 70 km/h, to see if such a reduction had any measurable effect on the number and types of accidents along that stretch of road.

To supplement the campaign the police also held some additional speeding controls.

The campaign itself describes the accidents that can happen when speeding and to a lesser extent the increased risk of speeding tickets.

Risk communication elements used in the campaign

Perceived threat / consequences – The campaign is describing the potential treats and by doing so it intend to impact the driver’s perceived threats when driving faster than the speed limit.

Groupe pressure – By stating that 60% of the drivers already are following the speed limits, the individual would feel that he is the odd man out when driving faster than the speed limit. Through this one gets an effect of the perceived group pressure.

Evaluation of the campaign

The Institute of Transport Economics found that during the campaign period the average speed had been reduced by 1.2 precent (Phillips & Sagberg, 2013) and in the same period there was a 5 percent reduction in traffic accidents. According to TØI a portion of this can be connected to the reductions in speed (Elvik, A re-parameterisation of the Power Model of the relationship between the speed of traffic and the number of accidents and accident victims., 2013).

The TØI report also pointed to other reasons for these reductions. The average speed was on a downward trend also prior to the campaign and according to Elvik, the financial recession in 2008 also played a role as a contributing factor. (Elvik, I dårlige tider går det bra for trafikksikkerheten, 2013 A)

Remember seatbelts

Goal of the campaign

The main goal of the campaign is to remind drivers to use safety belts. Both those who forget to use the belt and those who choose not to use them. A second goal is to remind all drivers and passengers about how to use seatbelts correctly. This being especially important for children, who often need help from an adult to ensure belts are used correctly. The campaign, which lasted from 2015 to 2020, builds on previous campaigns promoting the use of seatbelts.

Target group

The target group for the campaign is people that travel by car or buss that don't properly use seatbelts, either by not actively using a seatbelt or by using the seatbelt incorrectly. The messaging in the campaign applies for anyone in transit, but most media messaging was focused on the user of public transport where the use of seatbelts traditionally has been low.

Campaign structure

The campaign consisted of two parts, one a series of posters and signs reminding to use seatbelts. These were posted on busses and as large signs along major roads. In parallel the slogan "Secure those you care about" was displayed in the different medias. The posters and signs were supplemented by a series of commercials in TV and cinemas to further enhance and spread the message.

Risk communication elements used in the campaign

The campaign focus on a combination of how to do things right (i.e., put on the seatbelt correctly) as well as the consequences of not wearing the belt if you are involved in an accident. By sharing information about best practices, the campaigners try to build on people's good intentions, build on group pressure/group control to achieve the preferred safe behaviour, and make the drivers and passengers evaluate if they are better off by wearing a seat belt.

Evaluation of the campaign

The formal evaluation report has not yet been published, but due to the positive feedback NPRA has stated that they want to continue the focus on wearing seatbelts and are currently in the process of evaluation how to design and structure future campaigns.

Even though the campaign is officially finished, NPRA viewed the signs to be so efficient, that they left several of them in place, continuing to remind people to wear seatbelts.

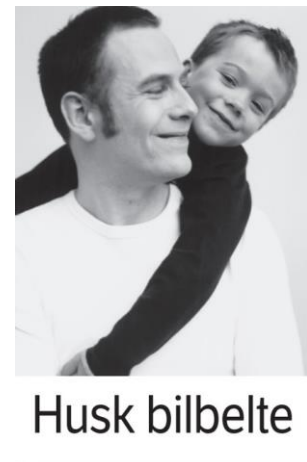


Figure 20. Remember seatbelts poster (Høye, Fyhri, & Bjørnskau, 2014)

The effect of traffic campaigns

The effect of traffic safety campaigns attracts much attention, and several reviews have been made trying to measure the effect with respect to changes in behaviour and reduction in number of accidents.

There are some studies that conclude that traffic safety campaigns have a positive effect. One of those were performed by a group of Japanese scientists (Haruhiko, Tomio, Nakahara, & Ichikawa, 2022) who observed a 2.5% reduction of deaths during the campaigns. A recent US study observed the opposite effect for safety messages conveyed by large signs along the road (Hall & Madsen, 2021). They observed an increase in accidents the weeks when the signs were displayed, which they attributed to drivers getting less attention to the road when reading the safety messages.

One of the most extensive collection of studies of the effect of traffic safety campaigns were published in 2011 (Vaa, Ulleberg, & Phillips, Meta-analysis of the effect of road safety campaigns on accidents, 2011) The study performed a statistical analysis ("meta-analysis") of 67 earlier analysis of effects of traffic safety campaigns, showing an average reduction of accidents of 9%.

The report underlines that the evaluations that are analyzed used different methods for measuring and calculating effects, and that this will impact the individual results.

In an earlier report from Institute of Transport Economics (Vaa, Assum, Ulleberg, & Veisten, 2004) the effect of combinations of measures was studied.

Campaign type	Effect	95% - CI	p<0.05?
- Campaigns by themselves	0,9	(-8,6 ; + 11,7)	No
- Campaign with Police controls	-12,7	(-18,9 ; - 6,2)	Yes
- Campaign + Police controls + Education	-14,2	(-22,0 ; - 4,9)	Yes
- Local personalized campaigns	-39,3	(-56,0 ; - 17,4)	Yes

Figure 21. The effect of traffic campaigns (Vaa, Assum, Ulleberg, & Veisten, 2004)

The sample they surveyed showed that campaigns by themselves have limited effect, but the effect can be improved by combining measures.

As noted above campaigns by themselves have little impact by themselves. But they are still an important tool in reaching fewer accidents. They work as reminders to both drivers, passengers and the society surrounding the driver, leading to peer pressure. They reach a lot of people, for the money spent.

Evaluation of campaigns is complex. One of the main challenges is the difficulty of having a reference group that has not been exposed to the campaign. Measuring the effect is also challenging, since there are several reasons for people's change in behaviour that cannot be attributed to the campaign. Over time driver education has become better, roads are safer, cars are safer, both physically and thru better driver aids. (Nees, 2019)

Method

Step 1 Find relevant literature

The first step involved a wide search for studies/literature studies that covered the behaviour theories that were related to traffic safety. The initial Google search identified a list of theories related to traffic campaigns and a wide range of publications/documents.

The long list of studies was reviewed to get an overview of the frequently used/quoted theories. The list of theories were organized in a table with number of citations to get a neutral measurement of their citation impact and their relevance. The theories that got the highest rating was then broken into single statements/key elements, that later could be compared to the selected campaigns.

Step 2 Find relevant campaigns

The second step was to get an overview over who were the main sponsors for traffic safety campaigns in Norway. When I added Norway or Norwegian, as a search criterion the work of the Institute of Transport Economics showed up high in the direct results and in references in documents with a high H & I index. They are a steady publisher of studies and articles related to traffic safety and they have also published evaluations of two of the campaigns in this thesis. (Phillips & Sagberg, 2013) (Karlsen & Bjørnskau, 2020)

The search showed that there are many traffic safety campaigns in Norway every year. However, many of these are local and small in scope. These smaller campaigns cover a wide range in format and target groups, and their documentation and description are less accessible. It was therefore difficult to select a representative sample and evaluate them in a consistent manner. This study therefore focused on evaluation of the larger campaigns with were covering several counties or a full nationwide coverage. There are two main sponsors of the larger traffic safety campaigns in Norway, The Norwegian Council for Road Safety, and the Norwegian Public Roads Administration. They both have large campaigns running over multiple years. This study includes the seven largest campaign that has been completed or started over the last 10 years.

Step 3 Describe the main theories

The different theories were described, and their key features were listed.

Step 4 Break the campaigns down into main campaign elements

As a third step each campaign was broken into different parts to make it easier to compare them to each other and the literature, this was done on their main features, these being the following: goal of the campaign, target group of the campaign, campaign structure, risk elements use the campaign and where applicable any evaluation of the campaign by externals.

This to get a better understanding of how the campaigns are structured, and how alike they are designed

Step 5 Compare theory point with key factors used in each of the campaigns. Look for similarities and differences

The fourth step was to start comparing the broken-down campaigns elements and comparing them to the different theories. This comparison was done to get an overview of what theories that were used in the different campaigns.

Another benefit of doing it this way was that it made it easy to compare what campaigns were built on which theories. Including the ability to see if there was a common thread among the campaigns, either in form of campaigns using the same theory or that a certain type of campaign used a certain type of theory to back up its work.

Step 6

Evaluate to what extent the major Norwegian traffic safety campaigns makes use of know theories

Based on the above analysis, evaluate if there were sufficient evidence in the reviewed material to conclude whether the larger campaigns utilize the theoretical elements in risk perception/ communication literature

Results

The results of the Google Scholar search showed a high number of hits for several of the behaviour theories. When narrowing down the search criteria by adding the words “traffic” and “campaign” the number of hits dropped (See figure 22). For this evaluation the threshold for being included in the evaluation was set to 5000 hits, meaning that nine theories were included in the scope.

Hits (x 1000)	Search Words		
	Theory (Only)	Theory + Traffic	Theory + Traffic + Campaign
Health Belief Model	3 200	417	244
Protection Motivation Theory	2 060	234	113
Theory of Planned Behaviour	1 370	364	90
Theory of Reasoned Action	464	342	88
Theory of Interpersonal Behaviour	1 490	31	26
Theory of Self-Regulation	2 240	55	26
The Didactic Relation Model	474	41	18
Elaboration-Likelihood Model	40	8	5
The Transtheoretical Model of Change	67	5	5



Figure 22. Results - Literature search

The long list of studies was reviewed to get an overview of the frequently used/quoted theories. The list of theories were organized in a table with their number of citations to get a neutral measurement of their citation impact and their relevance (Figure 23 Behavioural Theories – Citations of mostly quoted article). We noted that the article describing the theories with the highest number of citations with one exception was very frequently cited. The exception was the Didactic Relation Model that even though being recognized in Norway has limited foreign quotations.

Theory	Citations
Theory of Planned Behaviour	105 000
Theory of Reasoned Action	73 500
Elaboration-Likelihood Model	13 500
The Transtheoretical Model of Change	9 700
Theory of Self-Regulation	9 000
Theory of Interpersonal Behaviour	8 000
Health Belief Model	7 600
Protection Motivation Theory	7 200
The Didactic Relation Model	200

Figure 23 Behavioural Theories – Citations of mostly quoted article



For each of the seven campaign the application of behavioural theories is presented in the below tables (Figure 24,25,26, 27 and 28):

Campaign	Follow the speed limit	Thank you for paying attention
Logo		
Description	The campaign main message is that the majority of drivers follow the speed limit	The campaign remind drivers that driving requires full attention and that a few seconds without focusing on the traffic could be fatal for those inside and outside the car
Media	- Commercials - Digital Posters	- TV Commercials - Radio commercials - Commercials at Movie Theaters - Social media
Target Group	Drivers that drive marginally above the speed limit, assuming that their behaviour is normal, without fully realizing the added risk when driving faster than the speed limit.	The primary target groups are all drivers and passengers

Theories predicting



Theory of Reasoned Actions (TRA)	The campaign focus to changing the perception that driving faster than the speed limit is the norm. If the campaign is successful, it will impact the normative beliefs and thereby make the individual feel the group pressure which again may change the individuals intentions and behaviour. The campaign makes use of the mechanisms described in Arzen's Theory of Reasoned Actions	The campaign shares the consequences of not paying attention in the traffic, attempting to change the drivers awareness and thereby his "belief about the consequences" of not keeping full attention on the road. The campaign is making use of the rational thinking described in Azen's theory
Theory of Planned Behaviour (TPB)	The Theory of planned Behaviour is an extension of the TRA. The campaign makes use of the mechanisms described in Arzen's Theory of Planned behaviour, in this case the perceived social norms.	TPB has similar applicability to the "Thank you for Paying Attention" campaign as TRA
Theory of Interpersonal Behaviour (TIB)	Also in the TIB social factors and norms are a key element in describing behavior (similar to the TRA and TPB)	In addition to changing the "belief of consequences" the campaign also brings attention to drivers bad habits (like using their cell phone while driving) and tries to initiate the process of changing those
Health Belief Model (HBM)	Social factors are less important in the Health Belief Model, and as such the HBM is less relevant for the "Follow the Speed limit" campaign.	The HBM could be used to describe the mechanism needed for drivers to maintain focus in driving. Avoiding interruptions requires a minor adjustment of behaviour that makes a significant reduction in risks of accidents.
Protection Motivation Theory (PMT)	PMT focus mainly on how the individual behave when under heavy stress, and focus less on social factors	PMT focus mainly on how the individual behave when under heavy stress, and can not be used when describing the effects of the "Thank you for paying attention" campaign.
Elaboration-Likelihood Model (ELM)	The campaign builds on known information, i.e. every driver know that increased speed increase the risk in traffic, and add information on normal behaviour. As such the information may be processed through the central route as per ELM.	The campaign builds on known facts, i.e. most drivers know that taking the attention away from driving increase the chance of an incident. The campaign reinforces this information and may be processed through the central route as per ELM, increasing the change of a behavioral change.
Theory of Self Regulation (TSR)	The theory of self regulation can not be directly applied on the "Follow the Speed limit" campaign	The theory of self regulation can not be directly applied on the "Thank you for Paying Attention" campaign
The Transtheoretical Model of Change (TMC)	The target group will be in different stages, with the majority of the drivers most likely at the "contemplation stage". The campaign would focus on convincing them to move to the next stage Preparation and subsequent the Action stage.	The target group will be in different stages, with the majority of the drivers most likely at the "Preparation stage". The campaign would focus on convincing them to move to the next stage ("Action stage").
The Didactic Relation Model (DRM)	The campaign includes several of the elements in the DRM, with clear goals, well defined content, building on the target groups background and a choice of the arenas for sharing the information.	The campaign includes several of the elements in the DRM, with clear goals, well defined content, building on the target groups background and a choice of the arenas for sharing the information.

Figure 24. Behavioural Theories used in traffic safety campaigns (a)

Campaign	Better Collaboration	Not cool to be dead
Logo		
Description	The campaign aims to remind both drivers, cyclists and pedestrians to be more aware of each other when sharing the road.	The campaign presents the serious consequences of traffic accidents through a engaged presentation form a individual that share his/her personal story about an accident
Media	<ul style="list-style-type: none"> - Signs along major Norwegian roads - TV commercials - Information on social media - Information pamphlets 	<ul style="list-style-type: none"> - Presentation meeting/Speech - Reflections before and after the meeting.
Target Group	The primary target groups are all drivers, passengers and bicyclists	The target group were youth, 14–16-year old These age group are close to starting their driving education and it is timely to start to motivate them to be more active as passengers and more considerate when driving

Theories predicting		
Theory of Reasoned Actions (TRA)	The campaign focus on interaction between users of the roads. It promotes the correct behavior, rather than shaming for bad behavior. There is an element of motivation to comply with the behaviour expected by others, so the campaign is making some use of the rational thinking described in Azen's theory	The consequences of an traffic accident is shared in a setting that allow for reflection around the consequences of the future young drivers choices. The campaign is tailored to impact the "belief about the consequences" of not following traffic rules. Since the campaign gather groups of youths, the campaign will also impact group pressure, seeking to convince passangers to The campaign also This way the campaign is relying on the use of the rational thinking described in Azen's theory
Theory of Planned Behaviour (TPB)	TPB has similar applicability to the "Better Collaboration" campaign as TRA	TPB has similar applicability to the "Not cool to be dead" campaign as TRA
Theory of Interpersonal Behaviour (TIB)	TIB is not that relevant for this campaign, since the campaign does only to a limited degree play on social factors	Also in the TIB social factors and norms are a key element in describing behavior (similar to the TRA and TPB)
Health Belief Model (HBM)	The campaign does not build on the Healt Believe Model	Social factors are less important in the Health Belief Model, and as such the HBM is less relevant for the "Follow the Speed limit" campaign.
Protection Motivation Theory (PMT)	The model does not apply the Protection Motivation Theory	PMT focus mainly on how the individual behave when under heavy stress, and focus less on social factors
Elaboration-Likelihood Model (ELM)	The campaign builds on positive, considerate behaviour, which is easily addpated by the individual information, i.e. every driver know that increased speed increase the risk in traffic, and add information on normal behaviour. As such the information may be processed through the central route as per ELM.	The strong message conveyed by the speakers at the "Not Cool to be Dead" events, gives most of the audience strong motivation for change. Following the "central root" the processing of the message tends to leave a result that are maintained for a long periode of time.
Theory of Self Regulation (TSR)	TSR are not applicable for the positive considerate behavior promoted by the campaign	The theory of self regulation can cot be directly applied on the "Not Cool to be Dead" campaign
The Transtheoretical Model of Change (TMC)	The Better Collaboration campaign may be viewed to focus on the "Preperation" stage of the TMC, since many in the audience will be persuaded by the positive and logical message. The effect may not be lasting.	The target group will be in different stages, with the majority of the prospective drivers most likely at the "contemplation stage", since they have limited experience with evaluating the risk picture in traffic.
The Didactic Relation Model (DRM)	There are elements of DRM used in the campaign, but limited to goal, setting and content. An assesment is expected when the campaign is completed.	The campaign includes several of the elements in the DRM, with clear goals, well defined content, building on the target groups background and a choice of the arenas for sharing the information.


Figure 25. Behavioural Theories used in traffic safety campaigns (b)

Campaign	Which side of the speed limit are you on	Remember seatbelts
Logo		
Description	The campaign consists of a series of signs along the roads, some tv commercials and information in social media.	The campaign main focus is to increase the use of seatbelts in busses and maintain the already high seat belt rate in cars
Media	- Signs along major roads - TV Commercials - Social media	- Signs along major roads - Posters on busses - Social media commercials
Target Group	The campaign has a focus on reaching drivers age 25-40 in social media All drivers through the signs	- Focus on those traveling by bus - Secondary effect: Anyone that travels in a vehicle

Theories predicting behaviour change

Theory of Reasoned Actions (TRA)	The campaign focus on the increased risk when driving faster than the speed limits, attempting to change the drivers awareness and thereby his "belief about the consequences" of speeding. The campaign is making use of the rational thinking described in Azen's theory	The campaign reminds (bus) passengers and drivers that their behaviour impacts their family and loved ones. By building this picture, the campaign attempts to change the individuals "belief about the consequences" of the potential consequences of now wearing a safetybeltfull attention on the road. The campaign is making use of the rational thinking described in Azen's theory
Theory of Planned Behaviour (TPB)	The Theory of planned Behaviour is an extension of the TRA. The campaign makes use of the mechanisms described in Arzen's Theory of Planned behaviour, in this case the evaluation of the consequences.	The TPI make use of the same mechanisms as described above on TRA.
Theory of Interpersonal Behaviour (TIB)	Also in the TIB perceived consequences are a key element in describing behavior (similar to the TRA and TPB)	In addition to changing the "belief of consequences" the campaign also brings attention to drivers bad habits (like using their cell phone while driving) and tries to initiate the process of changing those
Health Belief Model (HBM)	An evaluation of the perceived treath is an element of the Health Belief Model, and as such the HBM is partly relevant for this campaign.	The campaign does not build on the Healt Believe Model
Protection Motivation Theory (PMT)	PMT focus mainly on how the individual behave when under heavy stress.	PMT focus mainly on how the individual behave when under heavy stress.
Elaboration-Likelihood Model (ELM)	The campaign builds on known information, i.e. every driver know that increased speed increase the risk in traffic, and add information on normal behaviour. As such the information may be processed through the central route as per ELM.	The campaign builds familiar information, reminding the individual that an accident adding the known information, i.e. every driver know that increased speed increase the risk in traffic, and add information on normal behaviour. As such the information may be processed through the central route as per ELM.
Theory of Self Regulation (TSR)	The theory of self regulation can cot be directly applied on the campaign "Which side of the speed limit are you".	TSR are not applicable for the positive considerate behavior promoted by the campaign
The Transtheoretical Model of Change (TMC)	The target group will be in different stages, with the majority of the drivers most likely at the "contemplation stage". The campaign would focus on convincing them to move to the nest stage Preparation and subsequent the Action stage.	The target group will be in different stages, with the majority of the drivers most likely at the "Maintenance stage". A high percentage of bus users would be at the "Contemplation stage", since thay already are aware of the benefits with using the seat belt in cars, but need to be convinced to also use it when riding a bus.
The Didactic Relation Model (DRM)	The campaign includes several of the elements in the DRM, with clear goals, well defined content and a choice of the arenas for sharing the information.	There are elements of DRM used in the campaign, but limited to goal, setting and content. An assesment is expected when the campaign is completed.

Figure 26. Behavioural Theories used in traffic safety campaigns (c)

Campaign	Share the Road
Logo	
Description	The campaign aims to remind both drivers and cyclists that the road is a shared asset and that they need to be aware of each other when sharing the road.
Media	- Commercials in Movie Theaters - Commercials in social media
Target Group	- All drivers, passengers and bicyclists

Theories predicting behaviour change

Theory of Reasoned Actions (TRA)	The campaign focus on the importance of sharing the road in such a way that everybody drives between users of the roads. It promotes the correct behaviore, rather than shaming for bad behavior. There is an element of motivation to comply with the behaviour expected by others, so the campaign is making some use of the rational thinking described in Azen's theory
Theory of Planned Behaviour (TPB)	TPB has similar applicability to the "Better Collaboration" campaign as TRA
Theory of Interpersonal Behaviour (TIB)	TIB is not that relevant for this campaign, since the campaign does only to a limited degree play on social factors
Health Belief Model (HBM)	The campaign does not build on the Healt Believe Model
Protection Motivation Theory (PMT)	The model does not apply the Protection Motivation Theory
Elaboration-Likelihood Model (ELM)	The campaign builds on positive, considerate behaviour, which is easily addapted by the individual information, i.e. every driver know that increased speed increase the risk in traffic, and add information on normal behaviour. As such the information may be processed through the central route as per ELM.
Theory of Self Regulation (TSR)	TSR are not applicable for the positive considerate behavior promoted by the campaign
The Transtheoretical Model of Change (TMC)	The Better Collaboration campaign may be viewed to focus on the "Preperation" stage of the TMC, since many in the audience will be persuaded by the positive and logival message. The effect may not be lasting.
The Didactic Relation Model (DRM)	There are elements of DRM used in the campaign, but limited to goal, setting and content. An assesment is expected when the campaign is completed.

Figure 27. Behavioural Theories used in traffic safety campaigns (d)

Discussion

In the analysis of the traffic safety campaign, we have reviewed their use of elements from the risk perception/communication theory.

The campaigns reviewed do all contain an element of explaining what could happen if we do not behave according to the recommended practice. That could be the increased risk of accidents if we are not wearing seatbelts, following the speed limits or focusing 100% on driving. This approach is in line with the Theory of Reasoned Actions which describes how behaviour are impacted by how the individual evaluate the probability and consequences of performing the said behaviour (Ajzen, 2012).

The broad campaigns, described in this thesis, targets both the drivers, passengers, and the general public. The latter two are important as they are having an indirect impact on the drivers' choices. As outlined in the Theory of Reasoned Action and the Theory of Interpersonal Behaviour expectations from the community (family, neighbors, peers) may also impact the behaviour since the individuals usually has a desire to be accepted/recognized for one's choices (Triandis, 1977).

Several of the campaign target a selected focused group, but since they often use media with a wide national coverage, the information is shared to a wider audience. As described above, this sharing of information outside the focus group may intentionally or unintentionally add to the campaign's efficiency by the way it impacts the individual's perception of community expectations.

Traffic safety campaigns that include information about both the (moderate) effort required to change the behaviour and the risk involved by continuing the behaviour, are utilizing similar mechanism to those described in the Health Belief Model, which describes how the individual does a mental cost (or effort) analysis, comparing the benefits with a changed behaviour with the effort involved in the change (Rosenstock, 1974).

The larger campaigns all have in common that they make a careful selection of which groups to target and how the methods should be structured. In doing this they can be seen as building on the principles from the Transtheoretical Model of Change (Prochaska & DiClemente, 1981). In short, they assess the level of the target groups, evaluating what behavioural change levels (as per TMC terms) the target currently resides at, how acceptable they are for influencing and what measures would be effective to impact their behaviour.

The Norwegian Public Roads Administration, that are responsible for most of the larger campaigns, are making extensive use of the Institute of Transport Economics (TØI) for pre-projects and evaluations of the campaigns. TØI's Section for Safety and Behaviour that perform the analysis, perform behavioural research for several customers and their international publications have a high number of citations.

The Norwegian Council for Road Safety has developed their own model for behaviour modification as a basis for their campaigns. Their model is based on other recognized risk perception/communication models and includes several of the elements described in the Theory chapter.

Measuring the effect of traffic campaigns

The traffic safety campaigns are one important element in the effort towards reducing serious traffic incidents. However, they appear to have limited effect on their own (Hoekstra & Wegman, 2010), but their effect improves if they are in combination with other measures.

Drivers' behaviour is impacted by their evaluation of consequences of their actions as described in the Health Belief Model (Rosenstock, 1974). As such any reminders of the consequences of breaking rules that they experience while driving, increase the likelihood of the drivers adjusting their behaviour. Such reminders could be police cars or personnel, signs that warn about automatic traffic controls and displays that show the actual speed. By increasing the perceived probability of negative consequences, the ultimate behaviour is impacted.

It should be noted that there are different views among experts to which theoretical behavioural change approach would be most effective (Hoekstra & Wegman, 2010). It is agreement that the safety campaigns may provide information/facts, increase motivation, and change attitude or social norms, either of which element may impact behavioural changes.

Weaknesses

The behavioural theory referred to in this thesis has its origin in in the traffic safety literature and may as such be somewhat limited. The authors of the selected models have a high "quoting index" and are as such still relevant, but there may still be significant models that was not included in this thesis, due to the way that our literature search has been performed.

This thesis has mainly been based on open sources, and even though they are broad and high in number, access to all pre-project studies and evaluations, combined with interviews of key staff would have strengthened the basis for the conclusions.

Conclusion

When starting this thesis, I had read several articles about (worldwide) traffic safety campaigns and had seen few direct references to risk theory. The view was confirmed by the Dutch Institute for Road Safety who had surveyed a high number of studies (Hoekstra & Wegman, 2010). My starting hypothesis were therefore that Norwegian traffic safety campaigns did not (fully) utilize the theoretical elements in risk perception/ communication literature.

During the review of the largest recent Norwegian safety campaigns, it was noted that the starting hypothesis needs to be qualified. In all the campaigns reviewed we see evidence of the use of elements from risk perception literature (Tables 21-25).

Both sponsors of the larger Norwegian traffic safety campaigns, The Norwegian Public Roads Administration and The Norwegian Council for Road Safety, are making use of scientific principles/methods in their preparation and evaluation of the campaign.

To summarize, my hypothesis was not correct since the major Norwegian traffic safety campaigns do utilize the theoretical elements in risk perception/ communication literature in their structure and methods.

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