

Trafisafe - Parental feedback for novice drivers

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Abstract (9 lines max.)

The purpose of this study was to evaluate the impact of parental feedback on novice driver behavior in the first 6 months of driving, aided by telematic data. A sample of 74 pairs of male novice drivers and their parents was randomly allocated to an intervention group (IG) or a control group (CG). Parents of the IG received weekly email safety reports, allowing parents to provide feedback about their kids' solo driving. Questionnaires for both novice drivers and parents were used to analyze acceptance. Results indicate that parental feedback aided by telematic data seem to have beneficial effects on teen driving as risky driving events were lower in the IG once feedback was established, statistically different from the 3rd usage month onwards. Questionnaire results also suggest positive influence on IG individual driving style and showed a good acceptance of the provided tools among users. Authors recommend telematic-aided parental feedback to reduce young driver risk directly after licensing.

Keywords: Keywords: Onboard Technologies (2), Transport Safety (10), Human Factors / Human Machine Interfaces (HMI) / User Needs / User Acceptance / Customer Satisfaction (11), Feedback, Novice drivers

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1. Introduction – The problem of young drivers and technology-based approaches to tackle it

1.1. Characteristics of young driver risk: Age and experience

Young drivers are vastly over-represented in accidents statistics. This fact remains valid globally until today as traffic crashes are the biggest killer of young persons aged 17-24, i.e. the age bracket where most people obtain a driving license and begin solo driving.

It is well understood that the elevated risk young drivers have for accident involvement is due to lack of experience, characteristics associated with youthful age, and the interaction between these two factors. All beginners are by definition inexperienced, and inexperience is known to be a crash risk factor whatever the starting age. Some authors examined the relationship between age and experience, highlighting that the first few years after licensure are at high risk of post-test independent driving, highest in the first months and decreasing steadily afterwards (e.g. Mayhew et al., 2000, Maycock, 2002, Vlaskveld, 2004, Wells et al., 2008). Likewise, mentioned authors also describe a continuum of age associated risk in way that risk is higher when persons begin driving early (age effect), although the accident risk drops off more quickly (experience effect) compared to older solo drivers. Moreover, although “entry risk” is lower for elderly beginners, they will not reach the low risk level even after years of driving experience compared to young beginners.

Focusing the very beginning of independent driving, a number of studies have found that the first 1,000 kilometres driven by a new driver may be the most important for reducing collision risk (Helman et al., 2010). For instance, Kinnear et al., 2009 (cited in Helman et al., 2010) show, that after novice drivers gained such amount of post-licence experience, they began to show physiological responses to developing road hazards presented in video clips similar to those shown by experienced drivers who have had three or more years of post-licence driving.

Especially in the first six post-license months of driving where novice driver risk is greatest which is also perceived by parents (Mayhew et al., 2006), parental involvement has a huge potential to positively influence their kids' driving behaviour when parenting style is appropriate (OECD/ECMT, 2006). Such an appropriate parenting style is characterised as an “authoritative” approach and involves behavioural influence by dialogue, negotiation, knowledge and feedback regarding the kids' activities.

1.2. In -vehicle Data Recorder as a mean for parental involvement

In-vehicle Data Recorders (IVDR) collect driving data such as location, speed, and acceleration-based information. The purpose of these telematic systems rests not only in documentation of behavior but merely has the aim to enhance traffic safety. In the light of improving driver risk, IVDR systems have been evaluated in this respect since devices emerged. A common approach to alter driving behavior for the better based on telematic data can be summarized by the following five mechanisms:

- Collection: IVDR collect objective safety-relevant driving data
- Norms: data put in perspective according to norms and limits
- Feedback: driving performance fed back to driver
- Consequence: reinforcing safe and weakening unsafe behavior
- Maintenance: keeping up the feedback loop

As regards the “consequence” term, it should be noted that “consequences” should not be understood having exclusively negative and punishing character. On the contrary, reinforcing good behaviour by incentivising safe driving is assumed as key element for mitigating driver risk or maintaining safe driving manners.

OECD/ECMT report (2006) presents a good overview of the benefits of parental involvement during the learning process but also highlights the importance of parental care as a “great deal remains to be learned” after licensure (Simons-Morton & Hartos, 2003). Mulvihill et al. (2005) and Cattan et al. (2008) state that parental monitoring during both learning-to-drive and post-license driving has also been found to positively influence their teen's driving behavior.

In a recent publication Omer et al. (2016) proposed the model of “vigilant care”, an example approach not only to be used within driver education framework but for all other aspects of parental education. It is understood as an

integrative solution defined as a “flexible framework within which parents adjust their level of involvement to the warning signals they detect. By justifying moves to higher levels of vigilance with safety considerations and expressing their duty to do so in a determined but non-controlling manner, parents legitimize their increased involvement both to the child and to themselves.”

Authors stress the difference to terms “supervision” and “monitoring” as these expressions are associated with either a detached or an intrusive inspectional character. Therefore, parental attitude should be grasped as “caring presence” in this context. The described “supervision” resembles higher levels of vigilant care when, having detected signs of alarm, i.e. aggressive driving, hence parents should move over to a more decided and focused kind of watchfulness.

One of the first promising results were presented by McGehee et al. (2007) who studied driving learning processes using an event-triggered video device in the US. By pairing the technology with parental feedback in the form of a weekly video review and graphical report card, parents’ ability to teach their teens after they have begun driving independently was extended. The IVDR captured 20-second clips of the forward and cabin views whenever the vehicle exceeded lateral or forward threshold accelerations. Their findings suggest that the combination of technology with parental weekly review and feedback of safety-relevant incidents more positively influences at-risk teen drivers.

A Finnish study by Tarkiainen et al. (2014) also looked at potential impacts of IVDR technology and parental feedback on novice driving behaviour. Seventy-five young male drivers together with their parents participated in the study, separated in a control group and a feedback group. Safety relevant information regarding driving style and eco-friendly driving was collected and feedback provided via website, smartphone and a weekly feedback report on individual basis. Findings suggest significant safety benefits for novice driver receiving parental feedback, especially regarding speeding behaviour. Both, teen drivers and parents indicated positive response to the implemented and evaluated feedback concept. However, authors also highlight the challenge to involve novice drivers in the study who are at a high-risk level, thus suggesting a self-selection moment that might have occurred regarding study participant selection.

Effects of parental vigilant care and feedback on novice driver risk were examined by Lotan et al. (2012) in Israel, who showed positive results among young drivers for their first driving year when using IVDR technology and feedback. Four study groups of young male drivers, one control group and three feedback groups were compared against each other as regards safety driving performance. The three feedback groups differed in the amount of feedback they received. Project results indicate major benefits for all feedback groups, but best results were achieved in the feedback group in which the parents received personal guidance. Furthermore, high correlations between safety performance of young drivers and their parents were found as well as correlations between certain personality traits (e.g. aggressiveness) and risky driving events.

To summarize, the aim of the present research study was to evaluate the impact of parental feedback on male novice driver behaviour in the first months of solo driving, aided by a specifically designed telematic-based data recording and feedback system for this purpose.

2. Method

A sample of 74 male novice drivers was selected, where half of the sample was randomly allocated either to an intervention group (IG) or a control group (CG). The difference between the groups was based on the provision of feedback in the IG, (or its absence in the CG), regarding individual driving style which was measured by a specifically developed in-vehicle data logger. The data logger measured safety-relevant driving parameters thus allowing parents to provide feedback about their kids’ solo driving by means of weekly safety reports sent by email and a web-based safety diary. The study took place in the eastern part of Austria.

2.1. Participant recruiting and requirements

Subjects were recruited with the help of three local driving schools. Co-operating driving school owners were informed about the general purpose of the study, i.e. the impact of parental feedback on driving behaviour and the requirements for participant selection. Furthermore, driving schools organised potential candidates. As driving schools frequently communicate with novice drivers and/or their parents due to the completion of the obligatory post-license 2nd phase modules, it was easy for driving school staff to identify and organise required test persons.

One of the obligatory modules is a feedback drive in real traffic, organised and provided by driving schools. If novice drivers chose to take part in the study, they would get the feedback drive module for free which is normally priced in the range of 120-150 euros.

The participants of the study were chosen to be male novice drivers, between 17 and 19 years old, and they should have between at least one but not more than four months of solo driving experience after passing the category B driving test. Participants could use either their own car or the family car in the study. Moreover, only participants who were driving on a frequent basis, i.e. at least 200 km per month, were selected. The parents of the subjects expected to have an internet access via PC and/or mobile phone. Finally, subjects had to have passed their driving test within an accompanied driving scheme, named "L17" in Austria. It is characterised by a longer learning and experience period. One important aspect within this scheme is parental involvement and feedback. As learner drivers are obliged to complete 3000 km before taking the driving test, they are typically accompanied by one parent who provides feedback about the driving. As a consequence, L17- educated drivers already had experience in receiving parental feedback when completing the driving test. However, after the driving test parents did not have any further role or involvement in the following development phases currently. Within this project, the philosophy of parental involvement and feedback was understood to be extended to the first months after the novice driver took the test on a voluntary basis.

It should be noted that during recruiting activities, some of the potential study participants refused to take part in the project after they learned more about the scope of the study. Not knowing whether they would take part either in the control or intervention groups, some of the potential candidates refused taking part in the study due to expectation of possibly negative consequences if driving data is accessible to their parents. This circumstance led to possible self-selection bias of study participants.

After driving schools screened and found potentially interested participants and parents, nine informational events, a' 6-10 persons, were organised, where the study scope and procedures were explained by the project team. Within information events for potential IG participants, the feedback website usage and rules of feedback were explained as well. Immediately after the info event, subjects were randomly allocated to groups (CG or IG) and subsequently data loggers were installed either in participants' own cars or their parents' cars.

During the information sessions before data logger installation, parents of the IG were informed about the enhancing role of feedback in the learning process. Above, parents were taught about the benefits of rewarding good driving behaviour. In contrast, also the aspects of using the data logger as a means to alter aggressive behaviour were openly discussed, i.e. which kind of consequences are appropriate if improper driving is recorded. The significance of driving style as a proxy of accidents was pointed out when explaining safety relevant driving parameters. However, as serious accidents are relatively rare events, feedback based on such seldom occasions will not be sufficient to induce more careful driving. Moreover, novice drivers might even be regularly motivated to arrive at a destination as fast as possible. Other factors, such as peer pressure or tendencies to "show off" were discussed, specifically in the light of the provision of feedback.

It was clearly pointed out, that the feedback system should not be understood as an instrument for spying in the sense of "big brother" but should rather be grasped as a supporting learning tool which helps to increase safety. Surely, this could be a balance act between enforcement and caring. In a recent study (Guttman & Gesser-Edelsburg 2010), the significance regarding the degree of information to be shown and used by parents and novice drivers was discussed. For instance, if trip information is very detailed, i.e. allowing for localisation and driving information of every second, this could be an obstacle for establishing such a system especially within the learning setting as the relationship between parents and their kids may be negatively affected. In this case, the acceptance from both users, i.e. novice drivers and their parents, would not be given. As a consequence, in this study, detailed positional data (trip map) were not presented in the project website.

2.2. Description of feedback technology

An in-vehicle data logging system was used to obtain safety-relevant driving parameters which were transferred to a web server where the data was processed further and illustrated on a website. Furthermore, aggregated safety relevant data was automatically sent every week to the parents allocated to the IG.

2.2.1. In-vehicle data logger

The in-vehicle data logger is a small box which was visibly installed in participants' vehicles mounted on the cars' windshield, powered via connection to the 12V cigarette lighter. Beside the data logging function, the device is also used for driver identification (via buttons) and feedback about the system state during driving (via LEDs on the unit). An additional SOS button can be used at any time to alert the account's registered mobile phone via text message of the vehicle's location in emergency cases such as accidents or breakdowns. If the SOS button is pressed, a text message was triggered which includes a web link to show the emergency location on Google® Maps.

The data logger records position and speed via GPS at a resolution of 1 Hz and accelerometer data. The built-in accelerometers are capable of measuring lateral and longitudinal acceleration (up to a maximum of 2g each) of the vehicle with an update rate of 100Hz. The data logger filters the acceleration with a -3db bandwidth of 10Hz and sub sample at 20Hz. The in-vehicle data logger transmits raw data, procedures are carried out by internet server, such as calculating risk indices, % of speeding, etc. Transferred data consists of:

- Unit serial number
- GPS-based data: position, speed and direction (1Hz)
- Accelerometer data, both longitudinal and lateral (20Hz)
- Driver ID
- Information, if power supply has been removed

When a trip is finished and uploaded via SIM card, the data is processed on the web server to be shown on the project website (Fig. 1):

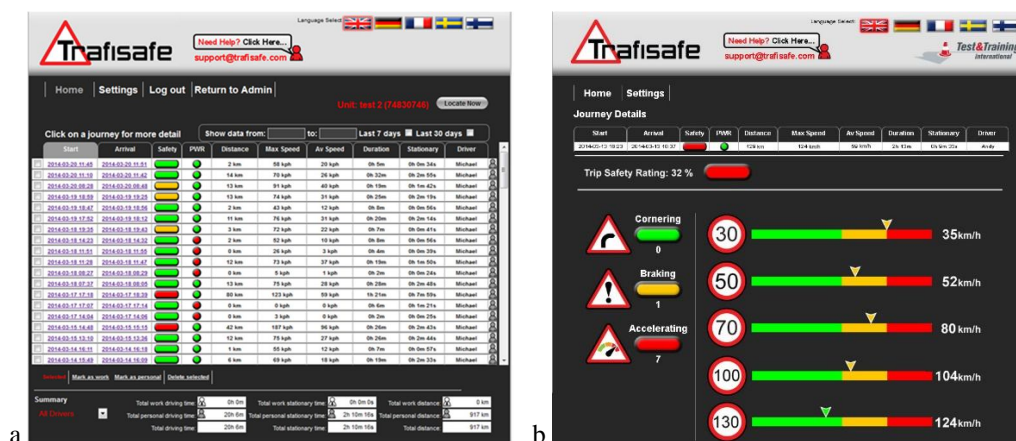


Fig. 1 (a) example driving diary; (b) example aggregated trip level information

After logging in to the Trafisafe website, parents could see a driving diary (Fig. 1, left) and aggregated safety-relevant data on trip level (Fig. 1, right). The illustrated trip-related variables on the driving diary (left) are date and time of a trip's start and arrival and a general safety assessment of the trip. The trip can be assessed in three ways: green (cautious driving), yellow (moderate driving) or red (aggressive driving). Furthermore, the web site provides information if the power connection of the data logger was lost e.g. by pulling the cigarette lighter power connection. Further summary statistics shown are the trip distance, the realised maximum and average speed, the trip duration, for how long the vehicle was stationary and finally who was the driver. On the bottom of the page, overall summary information is presented. By clicking and thus selecting on an individual trip, more detailed information is illustrated (right), such as an overall trip safety rating. This safety rating is a summary score composed by both driving dynamic variables, such as harsh cornering, braking or acceleration manoeuvres as well as speeding behaviour. The more unobtrusive the behaviour is in these respects, the better the overall trip safety rating score, where value "0" is the worst, "100" is the best score. On the left, driving dynamic variables are presented as coloured bars (green, yellow, red) as well as the number of harsh manoeuvres below the respective bars. Moreover, speed information is presented. The five most common speed zones are displayed and represent all respective speed zones that the driver was driving through. For every speed zone, a coloured bar is displayed,

indicating different speed thresholds within the speed zone. The realised maximum speed for different speed zones is indicated on the coloured speed bar by a yellow arrow on top of each speed zone bar.

As described above, the data logger identifies harsh manoeuvres, such as aggressive cornering, braking and accelerating. Based on these three driving manoeuvre types, an event rate index was defined as a sum of occurring events per minute of driving, thus normalising the index.

Speed behaviour was measured by a speeding time ratio. The ratio relates the time of realised speed below the speed limit with the time spent above the posted speed limit. Thus, speeding was observed for separate speed limit zones (30, 50, 70 and 100 km/h) and on an aggregated level (sum of all speed zones).

3. Experimental Design

3.1. Research questions

As especially young male drivers are at risk, it was decided to only focus on this group at their highest risk, i.e. in the first months of driving. The main research questions of this study are two-fold:

1. If and how a monitoring system in combination with parental feedback affects risk among young, male drivers
2. If such an approach is interesting enough for parents to invest to such a device during the first solo driving months of their kids

Following the selection procedure carried out by driving school staff and installation of the in-vehicle data logger, participants of both groups did not receive any feedback during the first driving month of the study (screening period). One month after start of driving with the in-vehicle data logger, the login data for the feedback website was sent to parents of the IG and the weekly e-mail summary report was started to be transmitted (feedback period). Subsequent to the observation period of a total of 6 months, the data logger was de-installed and questionnaires were filled out. One questionnaire (Q1) for both, the CG and the IG, the second questionnaire (Q2) was filled out by the IG parents.

Q1 consisted of questions of both socio-demographic and behavioural nature. This questionnaire was primarily used to determine, whether the random allocation of subjects to one of the investigated groups was successful or not. The second questionnaire (Q2) focused on the views and opinions of the involved parents of the IG. Questionnaire items focused on the usability of the website tool as well as acceptance and implementation issues of the whole concept, i.e. the combination of ITS technology with parental involvement during the early post-license phase of novice drivers.

3.2. Statistical methods

In order to see if randomisation of participant allocation to one of the groups was successful, mean sample values were compared using Mann-Whitney-Wilcoxon ("U"-tests) or T-tests for two independent samples were applied. Moreover, Chi-Square tests were used to calculate potential differences regarding the driving data (frequency and distribution characteristics) in the first month of observation.

Questionnaire data was compared to identify potential differences by using non-parametric Mann-Whitney-Wilcoxon tests for two independent samples (also known as "U-tests"), driving data by ANCOVA (analysis of covariance) procedures in order to identify significant differences regarding driving events (event rate index) between groups and estimate potential confounding or interacting variables such as exposure at the same time. ANOVA (analysis of variance) procedures were carried out to reveal possible significant differences for speeding behaviour (speeding time ratio) between groups.

4. Results

In the present study, randomisation was successful if driving data would not differ between both the CG and IG within the first month after data logger installation as subjects of both groups did not receive any data or feedback, whatsoever. For the IG parents, access granted to the website was not given until at least a month of data collection.

Typically, the website services and weekly driving summaries for this group were established between the first and second month after data logger installation. A normalized event rate index (sum of occurring events such as harsh braking, accelerating and cornering, per minute of driving) and a speeding time ratio (speed below/above speed limit) was calculated as proxies of driving behaviour. Personal and vehicle characteristics and driving circumstances were collected via questionnaire (Q1). Subjects of both groups were asked and compared regarding the awareness of the data logger in general and for different situations (car entry, trip start, while driving).

No significant differences among both groups in terms of age or means of driving behaviour (event rate index, speeding), driving circumstances (exposure, trip purpose, driving time of day/day of week) and awareness of the data logger (in general and different driving situations) could be observed when groups were still undifferentiated by feedback, hence differences in the subsequent observation period can be attributed to the intervention and the feedback provided to the drivers. Figure 2 presents average event rates of both groups for each of the 6 observation months. In the illustration, month 1 corresponds to the first month of driving (baseline, no feedback for both groups).

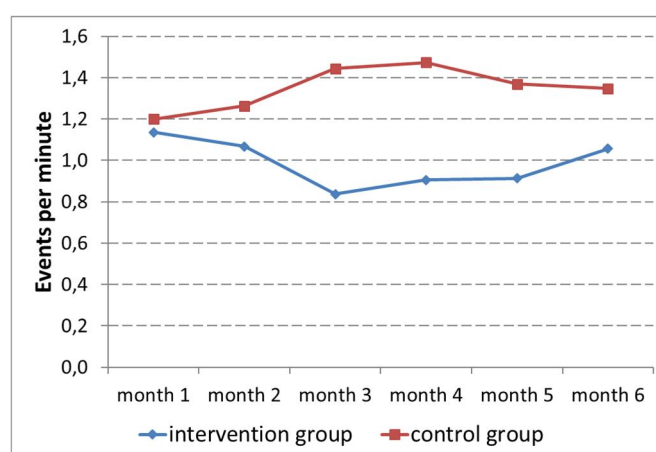


Fig. 2 Averaged Event Rate Index per month for each group

The development depicted in Figure 2 suggests differing progress over time for the groups, where the group receiving feedback performs towards a more favourable direction. At least visual difference occurs from month two onwards, where the novice drivers of the IG started to receive parental feedback. Table 1 presents differences between both compared groups regarding the dependent variable (normalized event rate index) with exposure (driven km) defined as covariate (ANCOVA analysis):

Table 1. ANCOVA comparison of event rate index in both groups, exposure as covariate.

Month	Variable	Mean Square	F	p	Partial Eta ²
Month 1	group	,114	,182	,671	,003
	exposure	,325	,520	,474	,008
Month 2	group	1,000	1,562	,216	,025
	exposure	,379	,591	,445	,009
Month 3	group	3,992	7,906	,007**	,116
	exposure	,051	,101	,752	,002
Month 4	group	5,042	6,983	,011*	,106
	exposure	,082	,114	,737	,002
Month 5	group	2,841	3,575	,064	,063
	exposure	,173	,218	,642	,004
Month 6	group	2,671	3,507	,068	,074
	exposure	,979	1,286	,263	,028

From the table it can be seen that both groups differ statistically significantly in month 3 and 4, group differences in month 5 and 6 can be interpreted as a statistical trend. Respective effect sizes increase over time, peaking in month 3, decreasing until month 6 again. No significant effects occurred regarding exposure as potential influencing variable (covariate) on the event rate index.

Aggregated speed behaviour expressed as speeding time ratio was used to calculate comparisons between groups. For both groups average speeding time ratio ranged approximately between 4 and 6 percent, over the observation period. ANOVA procedures were used to compare averaged speeding time ratios. Results show that the general speeding behaviour (over all speed limit zones) and speeding in respective speed zones (30, 50, 70 and 100 km/h speed limit) is statistically identical between the groups over the observation period as no significant differences could be observed. These findings suggest that the intervention had no statistical significant effect on the speed behaviour among analysed novice driver groups.

After the trial period, parents of novice drivers belonging to the IG were asked about their experiences with the feedback system, with 28 parents (11 female, 17 male) of the group filling out post-trial questionnaire (Q2). Views and opinions of the involved parents were collected. In general, the results of the post-trial questionnaire indicate a high acceptance of the used system. For instance, both the email summary and more detailed website were used on a regular basis by most of the participants. The level of information presented via these communication channels were rated as sufficient, however it was also stated there was room for improvement, especially regarding transparency of the algorithms, e.g. how trips are rated or classified.

A large share of novice driver parents stated to have used the collected and processed data to provide feedback of their kids driving behaviour. An interesting potential side effect could be observed as parents claimed to think about own driving behaviour as well by the usage of the telematic system. Hence, such an approach may have not only an impact on novice drivers themselves, but additionally on parental driving behaviour. Usage of the system was described as useful within the context of first months of teen driving, not only for the post-license period, but also before licensing.

This outcome suggests high approval among novice driver parents, as a large share claimed they would acquire a telematic system for feedback purposes. However, this conclusion must be cautiously interpreted as possible self-selecting mechanisms for study participation may have occurred.

5. Discussion, limitations and implications

The aim of this research study was to evaluate the impact of parental feedback on novice driver behaviour in the first six months of driving, aided by a telematic-based data recording and feedback system. Therefore, a sample of 74 pairs of male novice drivers and their parents was recruited, half of the sample was randomly allocated either to an intervention group (IG) or a control group (CG).

An in-vehicle data logger was installed in novice driver's vehicles to obtain safety-relevant data of driving behaviour. Collected parameters were vehicle location, speed choice and g-force based driving manoeuvres, such as cornering, braking and accelerating. Collected data was automatically transferred to a web-server after trips were finished; data were processed and aggregated. After a baseline month, participants of the IG received weekly email safety reports and obtained personal login credentials to access driving data, thus allowing parents to provide feedback about their kids' solo driving.

Safety-relevant data was aggregated to an event risk score, summarising harsh driving manoeuvres of cornering, braking and acceleration and normalised against driving time. Speed behaviour was operationalised by creation of speeding time ratio by relating time of realised novice driver driving speed below and above posted speed limits.

Comparing the groups during the first months of driving, parental feedback aided by telematic data had apparently beneficial effects on driving. Risky teen driving developed in a different manner if parents were involved in their kids driving in such a way that from the beginning of feedback implementation, risk scores start to decrease. Largest effects were found in the third feedback month, where differences between both groups were most salient and statistically significant.

Outcomes are comparable with the results of recent studies (Lotan et al., 2012, Tarkiainen et al., 2014), where parental feedback aided by telematic data during the first months of novice driver solo driving was associated with less risky driving behaviour and less speeding. However, for speeding, no impact of parental feedback was found in this study, as speeding time ratio parameter did not statistically differ between the analysed groups during the observation period. This result applies for all five different investigated speed limit zones. Tarkiainen et al. (2014), who carried out a parallel study in Finland, found that provision of speeding maps for parents, indicating where speeding has happened, suggest a positive impact on novice driver speed behaviour. Nonetheless, the approach used in the underlying study omitted detailed speeding maps, mostly due to privacy reasons for novice drivers.

Moreover, it was expected that too detailed speeding information may have an adverse effect on the relationship between parents and their kids, which authors did not want to affect. The decision of researchers using or omitting detailed speeding maps has to be considered from case to case (or country to country), as different cultural aspects have to be taken into account, ranging from a broader social point of view to a microscopic family level.

Results from the post-trial questionnaire for parents indicate a good acceptance of the general feedback approach and the used technical tools. From their view, such a system used voluntarily would not only make sense after licensing, but also in the learning period before. Furthermore, it was found that parents potentially benefit from the measure as well as triggering of self-reflection processes regarding their own traffic behaviour was reported.

Despite the positive results, effects must be interpreted cautiously as authors point out that the sample may have been self-selected, which leads to a potentially biased picture. On the one hand, obtained findings may lead towards too optimistic conclusions as outcomes are possibly not broadly transferable to all teen drivers and their parents. There may be some groups of persons who will not benefit from the investigated approach due to different personal and/or commercial reasons.

On the other hand, safety effects may be underestimated as some potential study participants refused to take part. They worried about the possible unveiling of inappropriate vehicle handling or severe traffic offences, also explicitly referred to as excessive speeding, leading to serious consequences, if undesired behaviour would be detected by their parents. Revelation of such improper or even dangerous novice driving behaviour would likely end up in improved driving manners. In this context, e.g. insurance companies could take over the parental role as consequences of aggressive behaviour would at least have negative monetary impacts.

One limitation of the study is the missing collection of how feedback was given and perceived in a structured manner. Although explanations for parents regarding, e.g. how to provide feedback were given during informational sessions at the beginning of the project, more structured data of parental feedback activities would have been helpful. In this context it is also recommended that future research should further focus on evaluating feedback technology among other target groups, predominantly in the field of professional drivers. Here, insights of a more structured and standardised feedback could be gained by investigating e.g. especially positive consequences and incentivised safety programmes within a professional framework.

Generally, authors conclude that the most promising intervention strategy to lower novice drive risk is a combination of several approaches, such as coordinated programmes for accompanied driving prior to licensing involving parental feedback and telematic technology. In the first months of solo driving after licensing, insurance discount schemes, featuring parents with as much input and involvement as possible, seem promising.

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