

Multi-phase driver licensing: First analysis of effectiveness¹

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1. Summary

Multi-phase driving licensing has been in effect in Austria since January 2003. All learner drivers must thus complete a safe driving course, psychological group discussion and two feedback drives with a driving school in the first year after gaining the licence. There were 11.2% less accidents amongst 18 and 19 year olds in the first half of 2005 compared to the first half of 2003. In contrast, accidents fell by 2.1% in all other age categories. A feedback analysis based on 1114 returned questionnaires showed above-average customer satisfaction with the traffic psychology group discussion and with the safe driving course.

2. Introduction

The multi-phase driving licence (second phase training) was introduced in Austrian law in early 2003. All learner drivers must thus complete a safe driving course, psychological group discussion and two feedback drives with a driving school in the

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first year after gaining the licence. After a hesitant start - the first safe driving courses only began in the summer of 2003 - the first full observation years of 2004 and 2005 for 18 and 19 year old novice drivers can now be considered.

The multi-phase licence is described in law as 'second phase training' (§§ 4a, 4b und 4c FSG). This is understandable from a legal perspective as the basic training has long been legally determined and now a further phase has been added after obtaining the driving licence. The term 'multi-phase driving licence' is, rather, the one used by traffic experts because this conveys the idea of continuous ongoing training through several modules which provide a harmonious and seamless continuum. In no way should the new multi-phase driving licence be considered solely an 'annex' to initial training.

The focus of the present analyses is on traffic accidents with personal injury in a before-after comparison and in comparison to all other age groups. A process evaluation in the form of a feedback analysis is also included.

3. Context of the multi-phase driving licence

The question as to whether any post-licence measures could reduce accidents (and if so, which) was first comprehensively documented and analysed in the EU DAN Project - **Description and Analysis of post licensing measures for Novice drivers** (Bartl, 2000a).

Obligatory 'anti-skid training' for learner drivers in the 1980s actually led to an increase in skid-related accidents, as Glad (1988, in the DAN Report) revealed. An obligatory technical driving course in Luxembourg was analysed as part of the DAN Report and no accident-reducing effects could be found. In contrast, a combination of practical driving exercises and demonstrations on a driving track, a feedback drive in regular traffic and a psychological self-evaluation of one's own driving style led to an accident reduction in Finland in the 1990s (Katila et al., 2000, in the DAN Report, p. 80).

The initial basis of the Austrian multi-phase training for categories A and B can thus be traced to the successes from Finland. Worthy of particular mention is the two hour traffic psychology group discussion which is combined with the six hour safe driving course in order to stave off any potentially negative effects from the latter training, and to form a common unit as laid down in § 4a Abs.4 FSG and § 4b Abs. 2 FSG of the multi-phase law. Exercises which could lead to overconfidence in one's abilities should be avoided (§ 13b Abs.1 FSG-DV).

The exact training requirements for the driving teachers, safe driving instructors and psychologists are also laid down in law. The two hour feedback drives also include discussion. The first feedback drive takes place between two and four months after obtaining the licence. This feedback drive is not required for learners following the more comprehensive L17 driver training programme. The second feedback drive takes place between six and twelve months after the licence. The combined safe driving course and psychological group discussion take place between the third and ninth month. Failure to attend these modules results initially in reminders and extended probationary period and ultimately to withdrawal of the licence.

The law was passed in the summer of 2002 by all 4 political parties in parliament.

4. Accident figures

Two accident analyses are presented in the following passages, based on data from Statistik Austria:

4.1. Accident figures 2004

In 2004 we can assume that practically every 18 year old learner driver applied for the multi-phase driving licence. In 2003 there was a considerable delay effect whereby many candidates applied for the old system towards the end of 2002 and only completed their training and testing months later in 2003. For this reason, the emphasis in this first analysis is placed on accidents amongst 18 year old car drivers. Of course, all other age categories of driving licence applicants have to follow the multi-phase system too, but most learner drivers are young. The possible influence of older learner drivers cannot be determined by the data currently available. Further analyses should not only take account of driver age, but also of how long the licence has been held. Only then can a precise analysis be made, such as the one carried out in the analysis of the probationary licence ((Bartl et al., 1997), in which accident timing could be compared not only with driver age but also with how long the licence had been held.

That analysis showed a reduction of 32.5% in accidents in a five year period after introduction of the probationary driving licence in 1992, compared to only 8.9% for other driving licence holders. The accident reduction was greater amongst older novice drivers than younger ones. The same phenomenon was found in the previously mentioned studies in Finland where, following the introduction of second phase training, the greatest reduction in accidents was found amongst male drivers who were older than 20. (Katila et al., 2000, in the DAN Report, p. 80).

The current analysis compares the number of injured or killed drivers in car accidents:

There was a reduction of 5.5% of such accidents amongst 18 year old drivers in 2004, compared to the previous year. The reduction amongst all other age categories in the same period was only 0.4%, compared to 2003.

The positive effect can especially be seen in the case of single-vehicle accidents: here there were 11% less accidents amongst 18 year olds in 2004. There was a reduction of 1.2% amongst other age categories. The details can be observed in the following tables (1 and 2):

Table 1:
Car accidents resulting in injured or killed drivers
 2000 - 2004

	18 year old car drivers		Other car drivers	
	Absolute figures	Change %	Absolute figures	Change %
2000	1155		22115	
2001	1256	+8.7%	23675	+7.1%
2002	1221	-2.8%	23790	+0.5%
2003	1235	+1.2%	23804	+0.1%
2004	1167	-5.5%	23706	-0.4%

Source: Statistik Austria / Institut Gute Fahrt

Table 2:
Car drivers injured or killed in single vehicle accidents
 2000 - 2004

	18 year old car drivers		Other car drivers	
	Absolute figures	Change %	Absolute figures	Change %
2000	468		4.173	
2001	549	+17.3%	4.562	+9.3%
2002	523	-4.7%	4.405	-3.4%
2003	508	-2.9%	4.538	+3.0%
2004	452	-11.0%	4.482	-1.2%

Source: Statistik Austria / Institut Gute Fahrt

4.2. Accident figures, first half of 2005

A more precise analysis of accident figures involving young car drivers can already be made for the first half of 2005, again based on data from Statistik Austria. In the following analysis, figures are considered relating to accidents causing personal injury involving 18 and 19 year old car drivers, and then compared to all age categories. Now it can be assumed that every 18 and 19 year old car driver in the first half of 2005 is either going through or has gone through the multi-phase driver licensing system. This data can then be compared to the first half of 2003 when the multi-phase system had only just been introduced. Any effects on older novice drivers still remain unclear.

2135 18 and 19 year old car drivers were involved in accidents causing personal injury in the first half of 2003. In the first half of 2005, this figure was only 1896. This is equivalent to a reduction of 11.2%. The change in all other car drivers was only -

2.1%. However, it should also be taken into account that other age groups of young car drivers have also shown reductions in accident involvement.

In the first half of 2004, there was already a reduction of 5.5% in accidents amongst 18 year old car drivers, in relation to the previous year, and a 5.8% reduction in the first half of 2005, amounting to a total reduction of 11.0% in comparison to 2003.

No effect could be seen amongst 19 year old drivers in the first half of 2004 (+0.5%). This is likely to be an indication of the influence of the multi-phase licensing scheme and the fact that most 19 year olds in 2004 had been trained under the old system. In the first half of 2005, however, there was finally a reduction in accidents amongst 19 year olds, to the tune of 11.8%. Further details are provided in tables 3, 4 and 5 below:

Table 3:
18 and 19 year old drivers involved in accidents causing personal injury
2003 - 2005 (according to first half of each year)

	18 and 19 year old car drivers		Other car drivers	
	Absolute figures	Change %	Absolute figures	Change %
1. half year 2003	2135	.	22558	.
1. half year 2004	2086	-2.3%	22831	+1.2%
1. half year 2005	1896	-9.1%	22077	-3.3%
Change in first half of year 2003/2005		-11.2%	-	-2.1%

Source: Statistik Austria / Processing: Institut Gute Fahrt

Table 4:
18 year old drivers involved in accidents causing personal injury
2003 - 2005 (according to first half of each year)

	18 year old drivers		Other car drivers	
	Absolute figures	Change %	Absolute figures	Change %
1. half year 2003	993	.	23700	.
1. half year 2004	938	-5.5%	23979	+1.2%
1. half year 2005	884	-5.8%	23089	-3.7%
Change in first half of year 2003/2005		-11.0%	-	-2.6%

Source: Statistik Austria / Processing: Institut Gute Fahrt

Table 5:
19 year old drivers involved in accidents causing personal injury

2003 - 2005 (according to first half of each year)

	19 year old car drivers		Other car drivers	
	Absolute figures	Change %	Absolute figures	Change %
1. half year 2003	1142	.	23551	.
1. half year 2004	1148	+0.5%	23769	+0.9%
1. half year 2005	1012	-11.8%	22961	-3.4%
Change in first half of year 2003/2005		-11.4%	-	-2.5%

Source: Statistik Austria / Processing: Institut Gute Fahrt

5. Process evaluation by means of a feedback analysis

In order to evaluate the process with regard to the safe driving course and psychological group discussion, 1114 novice drivers were anonymously asked to fill in feedback questionnaires in February and March 2005.

5.1. The experimental design

The questionnaire study was carried out in the following safe driving course centres in cooperation with psychologists from Institut Gute Fahrt: ARBÖ - Safe driving centre Ludersdorf near Graz, "Driving Camp" Pachfurth near Vienna, "Fahrtechnikzentrum Ost" in Kleinfrauenhaid near Mattersburg, "Drivers Point" Korneuburg near Vienna, Fahrtraining Steininger near Enns, Fahrwelt Kern near Braunau, and "Driving Camp" Röthis in Vorarlberg.

The participants were asked both about their expectations and their assessment of the safe driving course and psychological group discussion. This was asked using such variables as 'interesting' and 'useful' and by grading the instructors (safe driving course) and psychologists (group discussion) according to a five-point scale (1 = 'excellent'). Participants were also asked whether they thought the whole thing was a money-making scam and how well the safe driving course and psychological group discussion matched and enriched each other. Their personal driving ability were also evaluated using a five-point scale.

The questionnaires were given out to the whole group by instructors or psychologists with the express understanding that the questionnaires were anonymous. This was also indicated on the questionnaire itself.

5.2. Description of sample

456 persons were virtually randomly selected and asked about their expectations before the training day, and 658 others, also randomly selected, were asked the same questions via questionnaire after the training.

46.8% of the respondents were male, 50.8% were female and 2.4% did not declare their sex.

62.2% of respondents were aged 18 or 19. The age of the whole sample group is presented in Table 6 below:

Table 6:
Age distribution in whole sample

Age distribution	Frequency		
	Absolute figures	%	Accumulated %
17	147	13.2	13.2
18	459	41.2	54.4
19	234	21.0	75.4
20	57	5.1	80.5
21	25	2.2	82.8
22	21	1.9	84.6
23	23	2.1	86.7
24	11	1.0	87.7
25-29	25	2.2	89.9
30-39	43	3.9	93.8
40-49	19	1.7	95.5
50+	4	0.4	95.8
Missing	45	4.0	99.9
Total	1114	100	

5.3. Overall results for the safe driving day

If one summarises the results according to the 5-point scale with regard to the instructor, psychologist, personal usefulness and how interesting the training day was in groups of 6-12 participants, the average grade given is 1.7.

Responses to the same questions given before the training - with regard to expectations - delivered a result of 2.

The fact that the psychological and safe driving parts of the programme match well is borne out by an average grade of 1.94. In the pre-training questionnaire, expectations were significantly ($p = .001$) worse, namely 2.09.

Personal driving ability was given a pre-training grade of 2.33 and a significantly ($p = .01$) better average grade of 2.19 after the training.

The statistical procedure used here was the U-test.

5.4. Detailed results for the safe driving day

The 6-hour safe driving course was given an average rating of 1.52 at the end of the training, which is significantly ($p = .000$) better than the pre-training assessment of 1.63. For more detail, please refer to Table 7.

Table 7:
Before-after evaluation of the safe driving day

<i>Variable</i>	<i>Average value</i>	<i>Sign. P</i>
Overall grade before	1.63	.000*
Overall grade after	1.52	
Interesting safe driving course before	1.60	.011*
Interesting safe driving course after	1.52	
Useful safe driving course before	1.50	.204
Useful safe driving course after	1.57	
The instructor before	1.81	.000*
The instructor after	1.48	

In the pre-training questionnaire, 18.2% of respondents thought that the whole thing was a money-making scam, whereas only 13.8% answered this question with yes after the training (not significant). For details, please see Table 8.

Table 8:
Before/after comparison: "The safe driving day is just a money-making scam"

		Before		After		Sign. before-after
		Frequency	%	Frequency	%	
Results	Yes	83	18.2	91	13.8	.070
	No	316	69.3	470	71.4	
	unanswered	57	12.5	97	14.7	
Total		456	100.0	658	100.0	

5.5. Detailed results for the traffic psychological group discussion

The two-hour group discussion was given an average rating of 1.89 after the training day, which is significantly better than the pre-training rating of 2.37. All four variables relating to the group discussion were significantly better evaluated, the best of which being the psychologist as an individual with a rating of 1.46 ($p = .000$). This was the same rating as given to the instructors. For more details, please refer to Table 9.

The instructors are mostly all male, whereas the psychologists are female in the majority. For better readability, no distinction in sex is otherwise made in this report.

Table 9:
Before/after evaluation of the traffic psychological group discussion

<i>Variable</i>	<i>Average value</i>	<i>Sign. P</i>
Overall grade before	2.37	.000*
Overall grade after	1.89	
Interesting psychology before	2.49	.000*
Interesting psychology after	1.98	
Useful psychology before	2.33	.000*
Useful psychology after	1.98	
The psychologist before	2.31	.000*
The psychologist after	1.46	

34.2% of respondents thought the psychological group discussion was a money-making scam before the training, but only 16.1% of respondents answered this question with yes after the training (significant, $p = .000$). Please refer to Table 10 for more details.

Table 10:
Before/after comparison "The psychological part is just a money-making scam"

		Before		After		Sign. before-after.
		Frequency	%	Frequency	%	
Results	Yes	156	34.2	106	16.1	.000*
	No	223	48.9	432	65.7	
	unanswered	77	16.9	120	18.2	
Total		456	100.0	658	100.0	

An overall observation is that everyone who crossed 'yes' for the money-making scam also gave significantly lower ratings to both the safe driving course and psychological component ($p = 0 .000$).

5.6. Detailed results for driving ability

Every respondent who assessed his/her driving ability as 'good' or 'very good' (67.2% of the sample) also gave significantly better ratings for the safe driving course (SDC) and psychological component, as shown in Table 11.

Table 11:
Relation of driving ability with ratings

<i>Variable</i>	<i>Average value</i>	<i>Sign. p</i>
Good drivers' rating of the psychological component (1 or 2)	1.93	.000*
Bad drivers' rating of the psychological component (> 2)	2.18	
Good drivers' rating of the SDC (1 or 2)	1.53	.004
Bad drivers' rating of the SDC (> 2)	1.64	

5.7. Sex-specific differences

The response pattern of both sexes were rather similar; significant differences were only found in the following cases:

Before training:

Women had significantly higher expectations in terms of the usefulness of the safe driving course ($p = .04$). Their expectations in terms of how well the safe driving course and psychological group discussion would match each other were also significantly higher ($p = .001$). Men gave themselves significantly better ratings in terms of their driving ability ($p = .005$). There was no difference between the sexes in terms of assessment of the psychological component.

After training:

Female participants found both the psychological group discussion ($p = .001$) and the safe driving course ($p = .024$) significantly more interesting than the men.

6. Discussion of the results

The objective of the multi-phase driving licence was to combat the number one killer of young people - the traffic accident. In order to reach this goal, the content of the multi-phase training needed to be made in such a way as to reduce the frequency of the most common accident type in which young people die - the single-vehicle accident. In 2002, 64% of road fatalities amongst 18-24 year old drivers were single-vehicle accidents; in 2004 this figure was only 54%. This can be cautiously considered as an indication of the effectiveness of the new measures. In any case, the traffic psychologists are obliged, according to the law (§13c FSG-DV), to address the causes of single-vehicle accidents, such as collisions with trees, etc, in the group discussion, and to work towards developing strategies to deal with such situations. Indeed, it can be seen as a paradox that such a simple traffic situation as driving on an empty country road - which almost every novice driver has mastered after only a few hours of driving - actually represents the most deadly traffic situation. Clearly, by addressing this theme in the psychological component, and indeed more and more in basic training too, there can be an accident-reducing effect. This change within accident types is a poignant one, independent of the number of driving licences issued.

The absolute figures available from Statistik Austria underline this effect. There were 11% less single-vehicle accidents amongst 18 year old drivers in 2004 than in 2003. During the same period, there was a reduction of only 2% in all other age categories. The 18 year old group is of primary interest because relatively few drivers were being trained under the new system in 2003 due to a considerable delay effect in introducing it (a lot of driving licence candidates applied for the old system up until the end of 2002 and only took their driving test around the middle of 2003). The first safe driving courses and psychological group discussions took place in the summer of 2003 and only then did the post-licence training slowly come into effect. We can thus assume that all 18 year old drivers in 2004 were in possession of a multi-phase driving licence. In contrast, there were hardly any 18 year olds in possession of the multi-phase licence in 2003, let alone any who had completed their post-licence training. Of course, there must also have been older novice drivers, but it is not possible to determine when their driving licences were issued from the data available. For this reason, the main focus of this initial analysis was on 18 year olds, even if effects of the multi-phase licence are also expected in other age groups.

The data analysed only includes accidents with personal injury. Accidents involving material damage are still not systematically collected in Austria and are therefore not available for evaluation. The number of newly issued licences is also not available at this time. Analyses with regard to possible changes in the number of newly issued licences should be taken into account in ensuing medium-term studies, so relative figures can be compared and accident risk can be deduced: the number of accidents in relation to the number of newly issued driving licences.

The trend noted in the first accident analysis from 2004 has continued in the first half of 2005. Now it can also be assumed that 19 year olds in the first half of 2005 have all been trained under the new system. A reduction of 11.2% amongst 18 and 19 year old drivers can be seen when comparing the first half of 2005 and the first half of 2003, whereas there was a reduction of only 2.1% amongst all other age groups over the same period. The significance of this effect can also be underlined here, in that reductions amongst 19 year olds only began in 2005, as most 19 year olds in 2004 were still being trained under the old system.

In spite of this, the relative number (the number of newly issued licences) remains unknown. It should also be noted that considerable reductions in accidents were also seen amongst 20-24 year old drivers. Whether this was due to the multi-phase driving licence or other factors should be examined in ensuing medium-term analyses. In Finland, it was shown that the most significant reductions in accidents were seen amongst novice drivers above 19 years old: there was a 50% reduction amongst male novice drivers older than 20, and 25% amongst 18 and 19 year old female novice drivers (Katila et al., 2000, in the DAN Report, p. 80). A comparable phenomenon (a clearer reduction in accidents amongst older novice drivers) could also be seen in the accident analysis of the probationary driving licence in Austria (Bartl et al., 1997) which was introduced in 1992.

This could mean that the clear reduction in accidents amongst 20 to 24 year old drivers in Austria may be explained by the following hypothesis: there were comparatively few multi-phase driving licence holders in this age category, but these drivers may account for an above-averagely strong reduction in accidents - as a result of the effectiveness of the multi-phase driving licence - and may thus have contributed to the overall reduction in accidents in this age category (around 11%).

At the same time, it should be stressed that the changes in absolute numbers were highest amongst the 18 and 19 year old drivers.

The accident figures of young drivers were not diminishing back in 2003; they changed in a similar fashion to the accident figures of the other age categories. This can be considered an indication that some sort of special causal effect on accidents must have occurred amongst young drivers from 2003.

Another possible explanation could be that the increasing price of petrol has affected driving behaviour, especially on young drivers. This would have a modest effect on traffic performance which could then be reflected in accident figures. However, this would not explain the previously stated positive changes in the field of single-vehicle accidents.

A further positive indication is the relatively high customer satisfaction regarding the safe driving course and the psychological group discussion. The feedback drives were not part of this study.

What is surprising is how well the psychological component was assessed, despite the fact that rather unpleasant themes are addressed and no 'action' is required, as in the safe driving course. And despite the fact that the psychologists had to address personal themes rather than conveying successful experiences, they were evaluated just as well as the instructors with an average rating of 1.5.

In a similar earlier study (Bernkopf, 2004) the psychologists were only given an average satisfaction rating of around 3 (on a five-point scale as in this study, where 1 is the best). In that study, the majority of psychologists that were evaluated by participants came from 'Drive' Ltd, a daughter company of the Kuratorium für Verkehrssicherheit. In the current analysis, only psychologists working for Institut Gute Fahrt were evaluated.

It should not be forgotten that high customer satisfaction does not automatically correspond to high effectiveness in terms of accident reductions. However, it is a fundamental requirement that participants be convinced of the significance of the safety themes and that they consider them to be very important.

The cooperation between psychologists and instructors is functioning smoothly in the manner intended by the law (at least in terms of the training looked at in this study) and is given a rating of 1.9 by participants.

In summary, the following points can be made:

1. The multi-phase driver licensing system has been introduced without any significant organisational or content-related problems and now seems to have been accepted. Based on the results of this study, there is no need for any improvements.
2. Initial indications suggest a clear reduction in accidents, especially with regard to single-vehicle accidents.
3. Customer satisfaction, at least in terms of the psychological group discussion and safe driving courses analysed here, is above-averagely positive.

4. Long-standing efforts to address the road safety theme are clearly leading to greater risk awareness.

7. Literature

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