AN EVALUATION OF THE EFFECTIVENESS OF THE SUPERVISED DRIVER-TRAINING SYSTEM IN FRANCE

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ABSTRACT

This paper presents an evaluation of the effectiveness of the French Apprentissage Anticipé de la Conduite (AAC), which is an optional initial driver training that seeks to reduce accident risk by novice drivers. The effectiveness of the AAC is estimated using a Case-Control study (521 Cases and 624 Controls) and the adjusted Odds ratio (AAC versus regular) from a multivariate logistic regression. Thirteen risk factors are retained as explanatory variables in the regression. An Odds ratio of 0.9 indicates a non-significant reduction in accident involvement of AAC participants in the two years following the acquisition of their driver's license. The discussion addresses the possible reasons underlying the lack of result, e.g. an absence of varied experience during the AAC period and possible undesirable effects under supervision such as a partial delegation of responsibility for driving tasks by the young driver to the supervisor. Our recommendations include that AAC be integrated into a gradual licensing scheme, and should focus on the gradual acquisition of various driving experiences (in terms of variety of driving situations).

'A 1000 kilometres trip always starts with a first step'. [Lao-Tseu, Chinese Philosopher, about 570-490 BC].

The Apprentissage Anticipé de la Conduite (AAC) is an optional car driver training program in France which enables young novice drivers to get first hand driving experience from the age of 16

onwards, before taking their driving test following their eighteenth birthday. A driving school practical training course of a minimum of 20 hours is followed by a 1 to 3 year period during which at least 3000 kilometres must be driven accompanied by an experienced driver, but not necessarily a professional driving instructor (generally the father or the mother or both). With the Traditional driver Training program (TT), a novice driver can take lessons with a qualified instructor from the age of 16 and can then take his driving test at the age of 18, without following an AAC program. In 2002, AAC participants accounted for about 25% of all learners.

The literature shows that risk decreases with age and driving experience.[1] Young driver risk is essentially characterised by a high level of risk taking, non-perception of risks, sometimes by danger acceptance and by traffic exposure in unknown conditions (for example a combination of an unknown route and unfamiliarity with alcohol intake) [Assailly, 1992; Page, 1995a-b].

As regards the relationship between driver training and road traffic accidents, most studies seem to show that driving school training, which often focuses on basic skill acquisition, does not reduce the accident involvement of young drivers after the driving test [Brown et al., 1987]. However, some training programs, which concentrate on risk perception, show that if the emphasis is put on higher skill level acquisition (perceptive and cognitive), the results can be beneficial for road safety. This is why several authors suggest that driver training and driving tests should focus more on these skills rather than only on basic skills [Mayhew & Simpson, 1995].

There are two major new training and licensing programs [Gregersen et al., 2000]: gradual licensing, which tries to limit the risk exposure of novice drivers at different stages, mainly after licensing; and supervised training, which focuses on the acquisition of driving experience under supervision prior to licensing. Gradual licensing is associated with a decrease in the number of accidents of novice drivers [Bouchard et al., 2000; Shope & Molnar, 2003] even if it is sometimes associated with a reduction of their mobility [Langley et al., 1996].

The results for supervised driving are somewhat contradictory. In Sweden, where a system similar to AAC has been running since the mid-nineties, there has been a decrease in the number of accidents involving young drivers [Gregersen et al., 2000]. In France, the

[1] Driving experience being quite difficult to define and most often being taken as the number of months since passing the driving test, or driving exposure, meaning the number of kilometres driven.

various evaluations of the effectiveness of and the compliance to the AAC have yielded rather pessimistic results [Page, 1995a; Chatenet et al., 2001]. The different results observed in France and Sweden raise the question, once again, as to the evaluation methods of safety measures. It is well known that the results of an evaluation study are largely dependent on the methods used which vary between studies. This obviously makes the comparison of results quite difficult. These differences also lead us, in another part of this study, to the question of compliance to AAC: does the practical training follow the theoretical guidelines? [Page, Ouimet, & Cuny, 2004].

This paper presents an evaluation of the effectiveness of the AAC. First, a description of the participants is provided, followed by the statistical estimation of the relative risk of involvement of young drivers in a personal injury accident according to whether or not they have followed an AAC training program.

METHODS

In order to analyse risk and to characterise young driver sub-populations, we performed a Case-Control study. This involved creating two groups: one with drivers who had been involved in an injury road accident, i.e. in which at least one involved road user received a medical treatment (the Cases); the other with drivers who had not been involved in an accident (the Controls). Then a certain amount of important information about road traffic risks (including AAC) is collected for each driver. And the relative injury accident involvement risk for the AAC drivers compared to the others (TT) is estimated using the Odds ratio relative risk estimator.

A first data file was supplied by the MAIF (a French insurance company) and involved an anonymous list of drivers aged between 18 and 22 who had signed an insurance contract for a passenger vehicle in 1999 or 2000 as contractor (and thus principal driver) or simply as principal driver. Approximately half the drivers had been involved in a injury road traffic accident during the trial period (1881), whilst the other half had not (1976). The total number of drivers involved in the study was 3857. The sample of young drivers who had not been in an accident was drawn randomly from the population of young drivers who had signed an insurance contract for at least one month during the study period. The second sample, containing the young drivers involved in a injury road accident, who had also signed an insurance contract for at least one month of the study period, accounted for the rest of the population. These files provided the general characteristics of the insured drivers and vehicles (age, gender, type of vehicle, insurance period, etc.).

The insurance data did not contain enough risk factors (i.e. driving licence, level of education, age at licensing, occupation, mileage) that would enable a thorough and relevant risk analysis. We then completed the first data file supplied by the insurance company by adding information taken from driver declarations (questionnaires were sent by mail and the responses were anonymous as we used an identifier to link the first files to the questionnaire), which enabled us to describe the populations according to their general characteristics, to explain accident risk and to quantitatively confirm certain hypotheses formulated by previous studies. The questionnaire included items describing: participants and their parents, type of driving licence, type of initial driver training, mobility, behaviour, attitudes and opinions concerning risk, elements underlying the choice of the vehicle purchased, type of vehicle driven and its equipment, and type of road traffic accident in which they were involved [see Page et al., 2004 for a complete list of items]. Despite following-up after mailing the questionnaire, the reply rate was only about 30%. The final sample contains 1145 young drivers, with 521 Cases and 624 Controls (Table 1).

	AAC	% Column	% Row	TT	% Column	% Row	Total	%
Cases	332	45%	64%	189	47%	36%	521	46%
Controls	413	55%	66%	211	53%	34%	624	54%
Total	745	100%	65%	400	100%	35%	1145	100%

Table 1 - Distribution of Cases and Controls according to initial driving education (AAC / TT)

We then had to reduce the size of the sample instead of using only the insurance data. We also tested for a selection bias since the reply rate was rather low, by comparing the distributions of common variables in the two databases (insurance and questionnaire). No bias was uncovered.

RESULTS

YOUNG DRIVER DESCRIPTIVE STATISTICS - The statistical part of the study was divided into two sections: the first one describes the sample of young drivers; the second focus on accident risk analysis. The results show that:

- As a whole, no significant difference was observed between the Cases and the Controls. There were more important differences between AAC and TT drivers.

- AAC drivers generally have a higher level of schooling than TT drivers.

- 90% of young drivers use their vehicle on a daily or almost daily basis, which means that the vehicle has become a part of their everyday life.

- AAC is a good way of preparing for the driving test. The first time success rate for the practical exam of young drivers who follow the program is higher than the rate of those who use traditional training methods (77% versus 59%). However, this finding might also be due to a selection bias due to the optional status of the AAC. Indeed, the AAC drivers might have had a higher success rate, regardless of their involvement in the AAC program.

This issue (selection bias) is a tricky one. We considered it with high care, noticeably in the risk analysis by taking into consideration, available and observable variables that mark the road risk and act as confounders.

- AAC reduces the age at which the driving test is taken because 9 out of 10 AAC learners take their test at 18 years old (1 out of 2 for TT). This can increase young drivers' risk [Levy, 1988; Vernick et al., 1999]. However, even if AAC drivers are exposed earlier, they are exposed less than TT drivers because, in the 3 years following their driving test, they drove fewer kilometres than their TT counterparts. This result contradicts previous research which showed that AAC drivers drove more than TT drivers in the first years following their driving test [Page, 1995a].

These two important factors, age at licensing as well as exposure, will be taken into account in the risk analysis in order to determine the contradictory implication of an earlier exposition for AAC and a longer mileage for the TT on the road risk.

- Cases drove more than the Controls. This difference starts at training initiation (AAC or TT) and continues until after the driving test (Figure 1).

- The acquisition of post driving test experience is facilitated by the frequent use of regular or known routes. But this experience is incomplete because journeys on new or unknown routes are rare.

This is similar to the AAC learning program experience during the accompanied period, where the most frequent journeys are on well-known routes or on long journeys where parents can easily let the learner drive. Very few journeys are specifically dedicated to didactic learning, training and mastery.

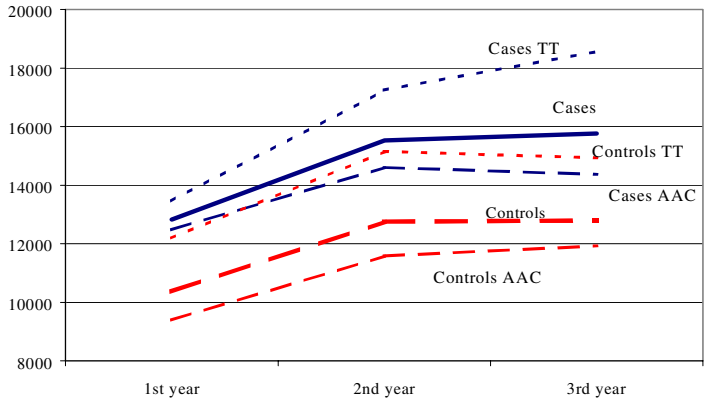

Figure 1 - Distribution of mean annual kilometres driven, one year, two years and three years after licensing

- The questionnaire included, for the cases, a few items regarding the conditions of their accidents. An Examination of these items shows that lack of experience in deteriorated, abnormal or irregular conditions plays a noticeable part in young driver accident involvement. This is true for example at night (and its related factors) and during rainy conditions. The majority of accidents (70%) are third party collisions, but over 50% of nighttime accidents involve a single vehicle. In addition, 50% of accidents occur in rainy conditions, twice the national average.

RISK ANALYSIS - The relative risk of accident involvement of AAC and TT drivers was estimated by the Odds Ratio using a logistic regression. Of the dimensions (i.e. variables in the common logistic regression vocabulary) available in our files (insurance company [I] and questionnaire [Q]), we finally chose those which were best able to explain accident involvement whilst limiting the amount of missing data. In particular, we retained variables that mark the road risk, that control for selection bias, or that show up discrepancies between cases and controls in the descriptive analysis:

- Total number of months insured (insurance coverage period for 1999 and 2000) (I)
- Number of kilometres driven after licensing (Q)
- Age (Q)
- Age at licensing (Q)
- Gender (Q+I)
- Level of education (Q)
- Main professional activity (Q)
- Initial training (AAC or TT) (Q)
- Vehicle model year (Q+I)
- Administrative power group of the vehicle (Q+I)
- Type of insurance coverage (I)
- Residence (Q)
- Proportion of kilometres driven in cities (Q)

When compared with the vast number of parameters which figure into the questionnaire, this limited number of dimensions (13) may appear surprisingly small, but statistical models also need parsimony, and we thus had to eliminate a certain number of dimensions for which we had not observed great differences between the Case and Control populations in the descriptive analysis.

Table 2 gives the results of the logistic modelling for two of the best models tested. The main difference between the two models concerns the exposure variable. As the number of kilometres driven was not reliable for some young drivers, the size of the sample is lower for the second one. The estimation of the associated Odds Ratio and its 95% confidence interval [Min; Max] is given for each parameter of each dimension.

It should be remembered that logistic regression requires the fixing of a reference point for each dimension which is then used to explain the results across the entire dimension. For example, the dimension ‘Age’ is the explanatory dimension at a reference point of ‘18 years of age’: thus the relative risk of accident involvement for drivers aged 19 at the beginning of the insurance coverage period is lower than for 18 year olds (Odds ratio of 0.6) and decreases further for 20 year olds (Odds ratio between 0.5 and 0.4 according to the model). Overall, for this explanatory dimension, we can say that the relative risk of accident involvement decreases according to the age at which insurance coverage is taken out.

The reference points for each explanatory dimension are highlighted with a star in Table 2.

Model 1				Model 2			
Number of observations : 1145 Cases : 521 / Controls : 624 AIC : 1575 SC : 1737 -2 Log L : 1511				Number of observations : 932 Cases : 425 / Controls : 507 AIC : 1271 SC : 1426 -2 Log L : 1207			
	Odds ratio	Min.	Max.		Odds ratio	Min.	Max.
Insurance Period	1.02	1.005	1.044	Km driven	~1	1	1
Age				Age			
18 *	-	-	-	18 *	-	-	-
19	0.6	0.4	0.9	19	0.6	0.4	1.0
20	0.5	0.4	0.7	20	0.4	0.4	0.7
Age at licensing				Age at licensing			
18 *	-	-	-	18 *	-	-	-
19	1.0	0.7	1.5	19	1.1	0.7	1.6
20	0.8	0.4	1.7	20	1.0	0.4	2.4
Gender				Gender			
Female	1.0	0.8	1.4	Female	1.2	0.9	1.6
Male *	-	-	-	Male *	-	-	-
Level of Educ.				Level of Educ.			
CAP-BEP-BEPC	2.9	1.8	4.9	CAP-BEP-BEPC	3.2	1.8	5.8
BAC	1.4	0.9	1.9	BAC	1.4	0.9	2.2
BAC + 2 yrs	1.4	0.9	1.9	BAC + 2 yrs	1.4	0.9	2.2
BAC + 3 yrs + *	-	-	-	BAC + 3 yrs + *	-	-	-
Occupation				Occupation			
Student *	-	-	-	Student *	-	-	-
Employed	1.0	0.7	1.4	Employed	1.0	0.7	1.5
Unemployed	1.1	0.5	2.4	Unemployed	1.1	0.4	3.0
Driver training				Driver training			
TT *	-	-	-	TT *			
AAC	0.9	0.7	1.2	AAC	1.0	0.7	1.2
Vehicle Model yr.				Vehicle Model yr.			
Before 1986 *	-	-	-	Before 1986 *	-	-	-
1986 – 1990	1.3	0.8	2.0	1986 – 1990	1.3	0.8	2.2
1991 – 1995	2.1	1.3	3.5	1991 – 1995	1.9	1.1	3.5
1996 – 2000	1.9	1.1	3.4	1996 – 2000	1.8	0.9	3.4
Car Power Gr.				Car Power Gr.			
1-5	0.8	0.6	1.1	1-5	0.8	0.6	1.2
6	0.9	0.7	1.4	6	0.9	0.6	1.4
7 + *	-	-	-	7 + *	-	-	-
Type of Contract				Type of contract			
'Proportionnelle'	0.7	0.4	1.4	'Proportionnelle'	0.8	0.4	1.7
'Initiale'	0.9	0.6	1.4	'Initiale'	0.8	0.5	1.4
'Différence'	1.4	0.8	2.4	'Différence'	1.5	0.8	2.7
'Pertinence'	0.9	0.7	1.4	'Pertinence'	0.9	0.7	1.4
'Plénitude'*	-	-	-	'Plénitude'*	-	-	-

Table 2 - Results of the two optimal Logistic Regression Models (Part 1)

	Odds ratio	Min.	Max.		Odds ratio	Min.	Max.
Residence				Residence			
Countryside*	-	-	-	Countryside*	-	-	-
< 5000 in.	1.1	0.8	1.6	< 5000 in.	1.1	0.7	1.7
5-10 000 in.	0.9	0.6	1.4	5-10 000 in.	1.1	0.7	1.8
10-30 000 in.	1.3	0.8	1.9	10-30 000 in.	1.2	0.8	1.9
30-50 000 in.	1.3	0.8	2.2	30-50 000 in.	1.6	0.9	2.8
50-100 000 in.	1.0	0.6	1.6	50-100 000 in.	1.3	0.7	2.3
> 100 000 in.	1.1	0.7	1.7	> 100 000 in.	1.2	0.8	1.9
Km in cities				Km in cities			
Less than 30%*	-	-	-	Less than 30%*	-	-	-
25% - 49%	1.2	0.9	1.6	25% - 49%	1.2	0.8	1.7
50% - 74%	1.1	0.8	1.6	50% - 74%	1.2	0.8	1.8
More than 75%	1.6	0.9	2.6	More than 75%	1.5	0.8	2.8
Somer's D = 0.267 Gamma = 0.268 Tau-a = 0.133 c =0.634				Somer's D =0.321 Gamma =0.323 Tau-a =0.160 C =0.661			

Table 2 - Results of the two optimal Logistic Regression Models (Part 2)

The two models give very similar results for all coefficients. They only differ according to the exposure parameter (number of months of insurance coverage or kilometres driven). We wanted to draw this distinction, because in a previous study [Page, 1995a], exposure was measured only by the number of months of insurance coverage and not by the kilometres driven which nevertheless remains the best risk exposure marker.

With both models, the Odds ratio attached to driver training is not significantly different from 1. In other words, the study conditions do not enable us to detect a difference in injury accident involvement between young AAC drivers and those who used traditional training methods, for the two-years period after passing their driving test. If there is such a difference, it represents less than 10% (Odds ratio of 0.9 using one model and Odds ratio of 1 with the other model).

This result is obviously the central point of our study. It more or less confirms, for injury accident risk involvement, the 1995 results on property damage accidents [Page, 1995a]. It is however disappointing from a road safety viewpoint, because AAC has long been presented as an innovative measure to combat accident involvement in young driver. It is important to remember that these results are valid for young, principal drivers insured by MAIF, over a limited time period after passing their driving test (2 years) and that it only measures the impact of such a measure on a fairly

unrepresentative population of young drivers (due to the choice of people insured by MAIF) and over a short time period. We think that it is impossible to evaluate the long-term effects of initial training.

As well as the interpretation of the coefficients associated with the modalities of the driver training parameter (AAC or TT), we can of course infer other results from the statistical modelling. The Odds ratios for each parameter, associated with a specific point on this parameter compared to the reference point that we have chosen, enables us to identify a number of risk markers for accident involvement among young drivers.

The first parameter that we can study is traffic exposure (marked by the number of months of insurance coverage for the first statistical model and by the number of kilometres driven after the driving test for the second model). This parameter is highly significant as the Odds ratio interval is extremely small. However, care must be taken here because the Odds ratio must be interpreted differently for quantitative and qualitative parameters. The Odds Ratios observed are close to or equal to one for the exposure parameters (for quantitative parameters, the Odds ratio = $e^{(n.\beta)}$, n being the units of exposure and β, the coefficient of the regression). They measure the increased relative risk corresponding to an increase of one unit of exposure (1 month for the coverage period and 1 kilometre for the distance driven).

Let us take two examples to illustrate. An Odds ratio of 1.02 for the insurance coverage period simply means, compared to a driver who was insured for x months during 1999 or 2000, a driver insured for x+1 months has a 2.5% higher personal injury accident involvement risk (5% for 2 months, 7.5% for 3 months, etc.).

An Odds ratio of 1.000016 (the exact value) for the distance driven means that, compared to a driver who has driven y kilometres during 1999 or 2000, a driver who has driven a further 5000 has an 8% higher injury accident involvement risk for the same period (16% for a further 10000 kilometres, etc.).

This way of modelling exposure is an important theoretical choice. It means increasing the risk by n%, whether increasing exposure from 3 to 4 months or from 10 to 11 months. It also means, in the case of the second model, increasing the risk by m%, whether increasing from 1000 to 2000 kilometres or from 10000 to 11000 kilometres, which is probably unrealistic because the first months of exposure are more sensitive than later ones. This is a known problem for the logistic regression of quantitative variables [Hosmer &

Lemeshow, 2000]. In this situation, the Odds ratio only makes sense when near to the mean value of the insurance coverage period and of the distance driven, and should be interpreted with care for other values.

The Odds ratio value, associated with exposure, may seem low. For example, a driver who has driven 25000 kilometres has only an 8% higher accident involvement risk than one who has driven 20000 kilometres, whereas we might expect a risk factor of 1.25 (if we consider that risk increases proportionally to the distance driven and that 5000 kilometres represents 25% of 20000). This difference is due to the fact that the risk is not strictly proportional to the distance driven (especially during the first few months of driving, because of the effect of age and experience) and that the Case–Control study is not adapted to this sort of calculation as it does not take into account the evolution in time of the exposure on an individual basis.

Driver gender, vehicle administrative power group[2], type of insurance coverage[3], age at licensing, place of residence, and driver profession (student or salaried) are not significantly associated with an increased or decreased accident involvement risk.

On the other hand, when compared to 18 year old drivers, 19 and 20 year olds present respectively a 40% and 60% lower risk. This confirms the literature, which shows a decrease in risk with age. Lower levels of education are also related to an increased risk of accident involvement (BEPC is the lowest level whilst BAC+3 is the highest). Whilst drivers who have graduated from high school or university have a similar accident involvement risk, those who left school before graduating have an Odds ratio of around 3. This also confirms the results found in the literature.

Vehicle age is also linked to an increased risk of accident involvement: the older the vehicle, the less it is involved in accidents. This relationship is not always statistically significant. It may also be biased because it is known that, especially for property damage accidents, older vehicles rarely have comprehensive insurance coverage (which means that single vehicle accidents are less often reported) or that the insurance company is not systematically informed of accidents when the vehicle is damaged beyond repair.

[2] The result is not surprising for this parameter as nearly all cars now belong to groups 8 and above. We were unable to identify more disaggregated groups because of a lack of statistical power.

[3] The MAIF proposes 5 types of insurance coverage (Proportional, Initial, Difference, Pertinence, Comprehensive), which range from third party coverage to fully comprehensive with different excess and guarantee clauses, depending on the type of coverage chosen.

Overall, there are few elements of the statistical modelling which enable us to identify factors significantly related to the relative accident risk. Other elements of the questionnaire were also tested, but without greater success.

DISCUSSION

This study failed to detect a difference in the injury accident involvement in young drivers of a light passenger vehicle insured by MAIF who followed either AAC or TT methods in the two years following driving licence acquisition. If such a difference exists, it represents less than 10% (Odds ratio of 0.9 according to one model and Odds ratio of 1 according to a second model). A larger sample would not have made a difference.

On the other hand, our young drivers sample might not be representative of French young drivers and we should interpret this new result cautiously. Nevertheless, this finding is consistent with previous studies on non-injury accidents.

A complementary analysis of the questionnaire [Page et al., 2004] enables us to identify the possible reasons for such an absence of benefit:

- The descriptive analysis showed that the driving experience during the AAC period is not varied enough even though the learners drove more than the required 3000 kilometres, i.e. about 5000. Driver training should include the acquisition of qualitatively varied experience in order to enable young drivers to gain driving experience in abnormal or difficult conditions which the parents cannot or do not confront: night driving, wet weather driving, driving on unknown or irregular routes, driving with passengers, difficult manoeuvres, etc. A list of these situations could be included in the training manual to help parents increase the proportion of teaching journeys which are at present significantly over-represented by routine journeys which do not provide sufficiently varied experience.

- Supervision may have undesirable effects, such as a partial delegation of responsibility for driving tasks by the young driver to the supervisor. This team driving might create stress or a lack of skills when the young driver has to drive on his own after the driving test. It is therefore important to ensure that the supervised driving period progressively requires more autonomy (which means reducing the role, the controls and the interventions of the supervisor) so that the young driver gradually stops delegating responsibility. Further

studies are necessary in order to evaluate the impact of the feedback that young drivers receive from their parents (for a time period similar to AAC) and to find a way to progressively and effectively reduce the amount of feedback. These questions were not sufficiently considered during the setting up of the AAC program.

- Selection bias is an important issue. Drivers who get into the AAC might be different from drivers who chose not to participate in this program. We found in a complementary analysis that the main reason for choosing AAC was that it provides a better preparation for the driving test and thus a greater chance of success. The other reasons stated are just as important including those directly linked to road safety which seems to be a deeply ingrained concern for young drivers who have been through road safety training at secondary school. Arguments such as the desire to drive as soon as possible, the need to drive or the pleasure derived from it are also frequently stated. Young TT drivers deliberately chose this training method despite knowing about the principle and advantages of AAC. The reason most often given is the short time in which TT enables them to obtain their driving licence: they chose the method that gives them their licence the quickest even if AAC enables them to drive earlier.

We tried to control for the selection bias by including confounding markers in the regression analysis. As the sample size was small, we had to search for parsimonious models and consequently restrict the number of explanatory variables. Additional variables could have reduced the selection bias further. On the other hand, we tested a lot of variables that did not provide significant effects. Thus, we conclude that, if the selection bias exists, its effect is negligible.

Other negative points which undermine AAC efficiency were pointed out by Chatenet et al., 2001: minimal supervisor involvement, authoritarian driving commands, over-permissiveness by the supervisor for certain risky driving behaviour, adopting bad habits, absenteeism at pedagogical training sessions, lack of exchange during pedagogical training sessions which resemble Highway Code lessons and do not cover the obligatory topics. We have not been able to verify all these assumptions in our study but they might also explain the lack of benefit.

On the other hand, AAC produces other effects such as a higher success rate in the driving test (which nevertheless accelerates risk exposure) and a positive representation of driver training by the French parents population who encourage their children to opt for this training program.

Despite this observed lack of benefit of AAC, we continue to support AAC, if amended, for the following reasons:

- Gradual access to driving seems to have a stronger impact on post driving test accident involvement than supervised driving. Designed to control the risk exposure of young drivers and to limit certain driving related privileges immediately after obtaining the driving licence, it offers progressive mastery of different driving situations and increases the age at which unrestricted driving is made available. It thereby limits the negative effects due to the young age of drivers and their lack of experience.

- A gradual licensing has been in effect in France since March 2004 (Attestation Scolaire de Sécurité Routière (ASSR), Road Safety Scholar tests whose two levels are obligatory for pupils at school, mandatory Brevet de Sécurité Routière (Moped Road Safety Exam - BSR) for moped driving, and then probationary license for young drivers). AAC could be efficiently integrated in this structured, continuous and chronological driver training scheme from school up to 3 years after licensing. Hopefully, gradual licensing, encompassing AAC, could produce significant safety effects.

- Supervised driving has been shown very effective in Sweden, but less so in France. Due to a lack of information about the Swedish system, which is apparently obligatory, whilst the French system is voluntary, we suggest that a comparative study be carried out to explain these differences and eventually identify the obstacles to effectiveness in France.

Due to the most recent changes in youngster's accident prevention in France in 2004 (gradual licensing), AAC driver training could still hold promise if a thorough examination of its shortcomings leads to voluntary changes in its principles and applications.

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