Seat Belts Unfastened: Non-seat Belt Use in the Czech Republic

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Abstract. More than 56 thousand drivers lost their licenses due to traffic offences in the Czech Republic between the years of 2006 and 2013. In almost half of the cases the ban from driving associated with the non-compliance to the mandatory use of seat belts. At the same time, non-seat belt use annually leads to hundreds of drivers and passengers killed in traffic accidents in the Czech Republic. Thus, non-seat belt use represents one of the most frequent and severe traffic offences. However, we do not know how widespread is the non-seat belt usage in the population. Therefore, in this study, we explore the latent form of the non-seat belt use in the Czech Republic as well as related socio-demographic or behavioral factors. The quota sample consisted of 1079 drivers (18–89 years, 44% women). Almost one-third of the drivers admitted driving without fastened seatbelts during the last year. Women and more educated respondents had lower probability of driving without a seat belt than their male and less educated counterparts. At the same time, drink-driving, speeding, and perceived inadequacy of the non-seat belt use sanction led to the higher probability of non-seat belt use.

Keywords: Non-seat belt use · Risky behavior · Latent criminality · Survey · Czech Republic

1 Introduction

Traffic accidents represent a tragic part of everyday mobility. However, in many cases, injuries or even casualties related to traffic could be prevented by relatively small merits. For example, according to the National Highway Traffic Safety Administration (NHTSA) operating in the USA, seat belts have saved almost 150 thousand lives between the years of 1975 and 2001 [1]. As a result of the positive effect of the seat belt use, many countries over the world have implemented mandatory seat belt use along with penalization of non-compliance to these policies during the last 40 decades. However, there is still room for the harm reduction, even in the developed countries. For example, 55% up to 58% passenger vehicle occupants between ages of 16 to 44 years were killed in traffic accidents while unrestrained in the USA between 2003 and 2012

[2]. Thus, more thousands of lives could have been saved by using seat belts and other safety measures such as airbags [1]. Also, apart from the tragic nature of traffic accidents, their economic costs are substantial, e.g. up to $60 billion dollars annually [3, 4].

In Europe, many countries were gradually introducing the so-called demerit point systems to provide negative feedback for risky driving behaviour and to improve road safety. The Czech Republic is among those countries which introduced the demerit point system in the 2000s within the commitment of the EU to reduce road fatalities by 50% by 2010 in comparison with 2000. The points have been recorded since 1 July 2006. According to the evaluations, a demerit point system leads to the reduction of the number of road accidents and a significant reduction of fatalities from road accidents [5, 6]. However, the dramatic improvement of road safety within one year of operation decreases with the following years and has a lower effect on fatality on motorways [6, 7]. Although the effectiveness of demerit point system is the highest in one or two years from its introduction [8], it has, generally speaking, a long-term positive effect on the use of safety belts and child restraint systems [9].

Despite the employed measures, the situation regarding traffic safety is no less severe in the Czech Republic as in other developed countries in Europe or in the USA. According to the data provided by the Ministry of Internal Affairs, 56 thousand drivers lost their driving licenses due to traffic offences between the years of 2006 and 2013. While 24 551 (44%) of the drivers did not use a safety belt at least once, 13 016 (23%) did not comply with this rule twice or more. At the same time, according to the Road Safety Department of the Ministry of Transport of the Czech Republic (BESIP), 545 passenger vehicle occupants died in traffic accidents in 2016 and non-use of seat belts have led to hundreds of killed in traffic accidents annually in the past years [10, 11].

All of the previously mentioned information relate to the revealed non-seat belt use. However, undocumented non-seat belt use could be assumed as even more prevalent than its revealed form. At the same time, the latent form of non-seat belt use has received only limited attention. Thus, this study aims to explore the latent form of non-seat belt use among the population of drivers. Also, it focuses on the socio-demographic and other factors related to non-seat belt use that was identified by previous inquiry. The body of existing research pointed out that persons who are male, young, less educated, have a lower income, and reside in rural areas are less likely to wear safety belts than their counterparts [12–15]. Moreover, risky behavior such as drink-driving or speeding tends to be related to non-seat belt use [16]. Last but not least, compliance with the mandatory traffic safety measures relates to the perceived effectivity of law-enforcing system [17]. As a result, we use these variables to assess their relevance regarding latent non-seat belt use within the Czech context.

2 Methods

2.1 Design

Quota sampling was used to obtain data representative on the socio-economic basis. The quotas consisted of age, gender, educational background, and spatial characteristics such as the adequate proportion of respondents hailing both from urban and rural areas of the Czech Republic.

The data were collected via computer-assisted personal interview (CAPI) during the spring of 2016. No respondents had participated in a market research or an opinion poll at least 6 months before the data collection.

2.2   Methods

The data were collected via standardized questionnaire. It consisted of total 57 items divided into three sections.

The first part included indicators of the risky behavior–non-seat belt use, drink-driving (both right after the intoxication and in its delayed or 'residual' form), speeding less than 10 km/h, and speeding more than 10 km/h. In each of the variables, respondents stated that certain risky behavior either occurred or did not occur during the past year. The categories of answer were intentionally broad in order to minimize social desirability as well as cognitive burden.

The perceived effectivity of traffic police was measured by variables such as experience with traffic police control during the last year (that either occurred or did not occur), predicted number of drivers who change their behavior after traffic police control (on the scale from 0 to 10), and perceived adequacy of the legal penalization related to the non-seat belt use (either adequate or non-adequate).

The last group of variables consisted of socio-demographic characteristics such as age, gender, educational background or size of the town or the city that respondents live in (i.e. the number of inhabitants). These variables are covered further in the Sample section of the text.

The questionnaire was assessed as a whole in a pilot test–its completion time, the general intelligibility of the questionnaire, and the like. Five individuals (members of a general population with various age, gender, and educational and economic background) participated in the pre-testing, which revealed no problematic item or aspect of the questionnaire.

2.3   Sample

There were 1482 participants in the original sample. However, 403 of them declared that they did not drive a car at all in the past year. Since in this study we focus only on the active driver population, these respondents were omitted from further analyses. The final sample, therefore, consisted of 1079 respondents that had driven a car at least once during the last year prior to the survey.

In the sample, men (N = 606, i.e. 56%) were represented slightly more than women (N = 473, i.e. 44%). The mean age in the sample equalled to 45 (SD = 15). The youngest respondent was 18 years old, the oldest 89 years old. The age distribution is described further in Fig. 1:
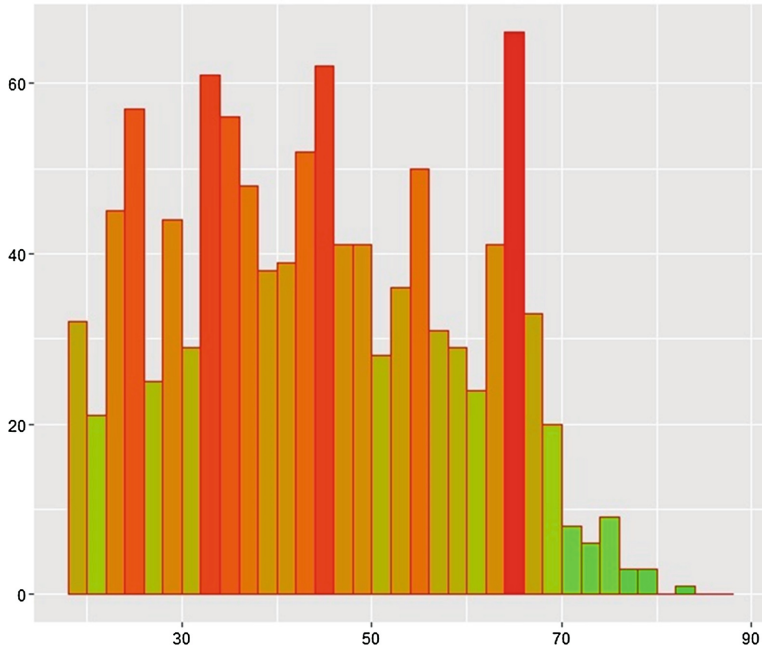
Fig. 1. Histogram showing the age distribution of the participants. The x-axis represents the age, whereas the y-axis the number of respective cases.

As for the educational background of the respondents, based on the International Standard Classification of Education or ISCED [18], 12% (N = 127) of respondents finished their education at primary level of education (ISCED1), 37% (N = 401) at general secondary education (ISCED34), 36% (N = 392) at vocational secondary education (ISCED35), and 15% (N = 159) finished their studies at tertiary level of education (ISCED5-8). From the income point of view, most of the respondents (821, i.e. 76%) refused to state their net monthly household income. As a result, this variable was omitted from the further analyses. Thus, the level of education served as the proxy of respondents' socio-economic status.

Last but not least, most of the respondents (N = 432, i.e. 40%) lived in towns with the maximum of 4999 inhabitants, 20% of participants (N = 213) lived in towns between 5000 and 19,999 inhabitants, and 24% (N = 262) respondents stated that they live in cities between 20,000 and 99,999 inhabitants. Lastly, 16% of the respondents (N = 172) lived in the cities with more than 100 thousand inhabitants.

3   Results

The data were analyzed via programming language and environment for statistical computing R [19].

3.1   Descriptive Statistics

When it comes to the traffic-related risky behavior, 30% of respondents (322) admitted that they had not used safety belts at least once during the last year. Speeding was even more prevalent as almost 70% (N = 719) of respondents stated that they breached the speed limit by more than 10 km/h at least once during the last year. Last but not least, 7% (N = 73) of drivers admitted drink driving. Table 1 contains detailed information regarding drivers' risky behavior:

Table 1. The occurrence of traffic-related risky behavior during the last year

Risky behavior	Never		At least once	
	N	%	N	%
Non-seat belt use	757	70	322	30
Drink-driving (actual intoxication)	1006	93	73	7
Drink-driving (residual)	914	85	165	15
Speeding (up to 10 km/h)	151	14	928	86
Speeding (more than 10 km/h)	360	33	719	67

Note: N = 1079

As for the indicators of the perceived effectiveness of the law-enforcing system, the mean value of drivers who, according to the participants, change their behavior as a result of a traffic-police control, ranging from 0 (actual minimum within the sample to 10 (actual maximum within the sample), equaled to 4.4 (SD = 2.6). Moreover, almost half of the participants (N = 503) declared that they had experienced traffic-police control during the last year. Last but not least, 74% of participants (N = 803) consider penalization for non-seat belt use as adequate.

3.2   Model Predicting Non-seat Belt Use

To assess factors related to the non-seat belt use, we conducted a logistic regression with non-seat belt use (never versus at least once during the last year) as the binary outcome variable. In every categorical variable, we used indicator coding with the first category as the referential one. The total of 1079 respondents entered the model. Results are presented in Table 2.

According to the model, age of the respondents, size of the town or the city that respondents live in (i.e. the number of inhabitants), drink-driving with residual alcohol, experience with traffic police control, and predicted the number of drivers who change their behavior as a result of traffic police controls did not account for non-seat belt use category membership. On the other hand, women and more educated respondents had a significantly lower probability of driving without a seat belt than male and less educated counterparts. At the same time, drink-driving in terms of actual intoxication, speeding in the both observed categories, and perceived inadequacy of the non-seat belt use sanction led to the higher probability of non-seat belt use.

Table 2. Final model of a hierarchical logistic regression

Predictor	B	SE	p	Exp (B)	95% C.I. for Exp (B)	
					Lower	Upper
Gender						
Women versus men	−.32	.16	.04	.72	.53	.99
Age	−.01	.01	.19	.99	.98	1.00
Education						
Vocational secondary versus primary	−.16	.23	.51	.86	.54	1.36
General secondary versus primary	−.64	.24	.01	.53	.33	.85
Tertiary versus primary	−1.04	.30	<.00	.35	.20	.63
Size of the town/city in number of inhabitants						
5000–19,999 versus 4999 and less	.31	.20	.11	1.37	.93	2.01
20000–99,999 versus 4999 and less	−.19	.19	.32	.82	.57	1.20
More than 100,000 versus 4999 and less	−.09	.22	.70	.92	.60	1.41
Drink-driving (actual intoxication)						
At least once versus never	1.17	.32	<.00	3.21	1.73	5.98
Drink-driving (residual)						
At least once versus never	.26	.22	.24	1.30	.84	2.01
Speeding (up to 10 km/h)						
At least once versus never	.72	.34	.03	2.06	1.07	3.97
Speeding (more than 10 km/h)						
At least once versus never	1.15	.21	<.00	3.14	2.09	4.72
Traffic-police control						
No versus yes	−.17	.15	.25	.84	.62	1.13
Adequacy of the non-seat belt use sanction						
Adequate versus not adequate	.32	.16	.05	1.38	1.00	1.89
Number of drivers who change their behavior	−.02	.03	.40	.98	.92	1.03

Note: N = 1079, N = 1165; R^2 = .15 (Cox and Snell), .22 (Nagelkerke). Model χ^2 (8) = 3.26, p = .92

4 Discussion

This study had two aims. The first was to provide an insight into the latent criminality in non-seat belt use in the Czech Republic. From this point of view, non-seat belt use was quite present in the sample of drivers since almost one-third of them admitted this kind of risky behavior at least once during the last year. In addition, speeding was even more prevalent as 86% of all respondents declared that they exceeded the speed limit by less than 10 km/h and 67% by more than 10 km/h. Even though the number of drivers who admitted drink-driving was proportionately lower, its value was itself alarming. Overall, respondents declared a violation of the traffic rules quite openly. Their honesty may suggest that respondents did not identify themselves with the setting of the legal system in traffic or even internalize the legal system. If these values are to be truth in the population, much more effort has to be put into dealing with this issue.

However, this effort has to focus on the socialization of drivers, i.e. on psychological and cultural aspects of driving [20].

The second goal was to assess socio-demographic and other factors related to the non-seat belt use in the Czech Republic in its latent form. In this regard, the results are consistent with the previous findings in terms of men being more likely not to use seat belts than women or less educated persons more than those with a higher level of education. On the other hand, rural versus urban environment did not influence the non-seat belt use [12–15]. At the same time, the trend present in the educational level did not apply in our sample in general. Respondents with vocational secondary level education did not differ from those with a primary level of education in non-seat belt use. Both groups may have similar behavioral patterns based on similar lifestyles that negatively project into their attitudes towards risky behavior as well as into the actual behavior. Last but not least, despite the fact that almost half of the respondents declared experience with traffic police control during the last year, it did not play any role when it comes to the (non)seat belt use. Again, this may relate to only formal acceptance of the traffic laws by the respondents. The same principle is applicable to the perceptions of adequacy of the sanctions related to the non-seat belt use, which did not play a significant role when predicting non-seat belt use.

However, our study has several limits. First of all, our sample did not represent the general population as we focused solely on the active drivers. This fact may bias the external validity of our findings regarding socio-demographic characteristics such as gender or age of the participants, although the original sample reflected the general population in these aspects. On the other hand, overrepresentation of men and other socio-economic groups in comparison to the general population could be attributed to nature of the studied phenomena. At this point, however, we do not have the certainty. Moreover, quota sampling does not control for the systematic influence of variables that did not serve as quotas. In addition, measures used in this study provide only limited level of precision. As a result, it is not possible to differentiate between respondents in a more detailed way. For example, speeding by more than 10 km/h could include both 11 km/h and 50 km/h.

As for the further directions, measures assessing risky behaviour in greater detail are needed. At the same time, the further research should include psychological measures tailored for the context of traffic offenses, such as attitudes and perceptions towards non-seat belt use [21].

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