

NVF Webinar: Improving Road Safety for Young Drivers

Risk profiles among young drivers licensing at age 17

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Background

- Accompanied driving was introduced in Denmark in 2017
- Voluntary option for fully licensed 17-year olds
- All pre-license training done at a driving school
- The accompanying person must:
 - be 30, fully licensed for 10 years, able to take over legally at any time
- No requirements (e.g. registration, amount, type.....)
- Solo driving is automatically allowed at age 18

Today's presentation

1. The risk-profile of youth licensing at age 17

- Explore differences between youth choosing to license at age 17 and at age 18
- Focus on their attitude towards safety and self-assessed driving skills.

2. Is accompanied driving realized as expected?

- Amount of accompanied driving
- Self-assessed effect on driving skills and associated factors

Method

- *Online survey:*
 - 632 young drivers (53% male). 61% licensed at age 17, 39% licensed at age 18.

- *Measures:*
 - **Demography:** age, gender, occupation, residence, moped license, and licensing age etc.
 - **Attitudes towards road safety:** 5-point scale, agreement with 10 statements
 - **Self-assessed driving skills:** Danish version of the Driver Skill Inventory (DSI), participants rated their driving skills on a 5-point scale from “well below average” to “well above average”.
 - **The type of accompanied driving:** 3-point scale. Participants indicated to which degree (from “low degree” to “high degree”) accompanied driving had included 17 different traffic situations
 - **Self-assessed effect on driving skills:** 5-point scale from “no” to “yes, to a very high degree”.
 - **Interaction between the young driver and the accompanying person:** 8 statements, 3-point scale from “a low degree” to “a high degree”.

Method

- **Attitude towards safety:**

Factor analysis with Varimax rotation revealed a three-factor solution:

1. *General safety* attitude, 2. Attitude towards *speed limits*, 3. attitude towards *penalties* for road traffic violations.

- **Self-assessed driving skills:**

Factor analysis with Varimax rotation confirmed the original two-factor solution:

1. Perceptual-motor skills and 2. Safety skills.

- **Type of accompanied driving:**

Factor analysis with Varimax rotation revealed a three-factor solution: *Technical manoeuvres*, *Complex traffic situations*, and *Challenging driving conditions*.

- **Self-assessed effect on driving skills:** 5-point scale was transformed into a binary variable “little or no”/“yes, to a very high degree”

- **Interaction between the young driver and the accompanying person:** Factor analysis with Varimax rotation revealed a two-factor solution: hostile atmosphere, and positive atmosphere.

Variables predicting the likelihood that the license was obtained at age 17 (L17) compared to age 18 (L18).

Variable	Category	Est.	SE	P-value	OR	95% CI
Intercept		-3.20	0.94	<0.01	-	-
Gender	Male	-	-	-	-	-
	Female	0.61	0.18	<0.01	1.83	1.28–2.63
Residence	Three largest cities	-	-	-	-	-
	Five second largest cities	0.53	0.32	0.10	1.69	0.90–3.17
	Zealand	-0.04	0.27	0.89	0.96	0.57–1.63
	Funen and Bornholm	-0.00	0.36	1.00	1.00	0.49–2.03
Mother's transport	Jutland	0.48	0.25	0.06	1.62	0.98–2.66
	Often uses public transport	-	-	-	-	-
	Never/rarely uses public transport	0.96	0.32	<0.01	2.60	1.40–4.85
Attitude	General safety	0.62	0.16	<0.01	1.85	1.34–2.56
	Speed limits	-0.23	0.11	0.04	0.79	0.64–0.99
Driving skills	Perceptual-motor skills	0.53	0.19	<0.01	1.71	1.16–2.50
	Safety skills	-0.42	0.21	0.04	0.66	0.44–0.98
Number of observations		632				
Wald Chi-square ($H_0: \beta = 0$)		48.64	P-value ($H_0: \beta = 0$)		<0.001	
Degrees of freedom		10	AIC		845.04	
Hosmer-Lemeshow, Model P-value		0.98	R-square		0.08	

Logistic regression:
The independent effect of the different aspects on the choice for L17 vs L18

Results – predictors of licensing at 17 vs 18

Odds increase if:

- female
- mother “never/rarely” uses public transport
- higher score on general safety attitude
- higher score on perceptual-motor skills

Odds decrease if:

- higher support to speed limits
- higher score on safety skills

What does it mean for young driver road safety?

(possible) increased risk among people licensing at 17 + mothers travel behaviour important

Speeding and high score on perceptual-motor skills associated with increased crash risk

Follow-up and awareness is needed

Amount of accompanied driving?

81% - at least once a week

41% - 3 months or less

31% - 4 – 6 months

28% - 7 months or more

Average trip = 23 km., median was 20 km.

25% had driven <400 km, 50% <1060 km and 75% <1680

Huge uncertainty – but

Less than what is recommended in other countries (2000 km – 7000 km)

Less than the average total of 2400 km in Germany which was associated with a decrease in crash rate during the first year of solo driving.

What does it mean for young driver safety?

Amount of driving experience obtained between licensing at age 17 and solo driving at age 18 may not be sufficient to obtain a safety benefit. Follow-up needed.

Comparison of mean scores between L17 who indicated that accompanied driving had improved their driving skills to a “high degree” vs to a “low degree”/ “not at all”.

Factors		Skills improved to a high degree		Skills improved to a small degree/not at all		t-test,
		Mean	SD	Mean	SD	p-value
Maneuvers/ situations ^a	Technical maneuvers	2.12	0.60	2.04	0.56	0.20
	Complex traffic situations	2.30	0.51	2.13	0.56	<0.01
	Challenging conditions	1.93	0.52	1.87	0.51	0.28
Emotional climate ^a	Positive atmosphere	2.69	0.33	2.23	0.55	<0.01
	Hostile atmosphere	1.26	1.26	1.46	0.53	<0.01
	Supportive ACP	2.75	0.35	2.54	0.52	<0.01
	Non-supportive ACP	1.52	0.25	1.60	0.29	<0.01
Self-assessed skills ^b	Perceptual-motor skills	3.80	0.58	3.66	0.68	0.03
	Safety skills	3.90	0.60	3.77	0.64	0.04

Note: ^a 3-point scale from “a low degree” to “a high degree”. ^b 5-point scale from “well below average” to “well above average”. N = 373

Results

Self-assessed effect

A small majority (56%) indicated that accompanied driving had improved their driving skills to a high degree

Self assessed improvement in driving skills

- Only half of the participants believe that accompanied driving improved their driving skills
- Interaction between the young driver and the accompanying person is important
- A supportive atmosphere, engagement in complex traffic situations during the drive - accompanied driving had improved their driving skills
- Higher score on both perceptual-motor skills and safety skills among those who believe that accompanied driving improved their driving skills

Conclusion

1. Risk profile among youth licensing at age 17

- Higher score on perceptual-motor skills and less support to speed limits indicate yes
- Gender differences may be increased

2. Is accompanied driving realized as expected?

- Amount of accompanied driving may be insufficient to achieve a safety benefit
- Possibly overestimation of own skills?
- Interaction of accompanying person is of high importance

What to do to support a safety benefit of the Danish accompanied driving scheme?

- Measures focusing on speed and risk-taking behaviours are important
- Requirements (or specific guidelines) regarding the amount and type of accompanied driving are relevant.
- Guidelines for parents to support the creation of a positive atmosphere during the drive are important
- Follow-up needed

Further reading about accompanied driving in DK

Møller, M., Janstrup, K.H., Hjorth, K., Twisk, D.A.M. (2021). Introducing accompanied driving in Denmark. Safety-related differences between youth licensing with immediate or delayed access to solo driving. *Accident Analysis and Prevention*, 162, 106394. <https://doi.org/10.1016/j.aap.2021.106394>

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Thank you for your attention!

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