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RESEARCH



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Greek driver attitudes towards aggressive driving

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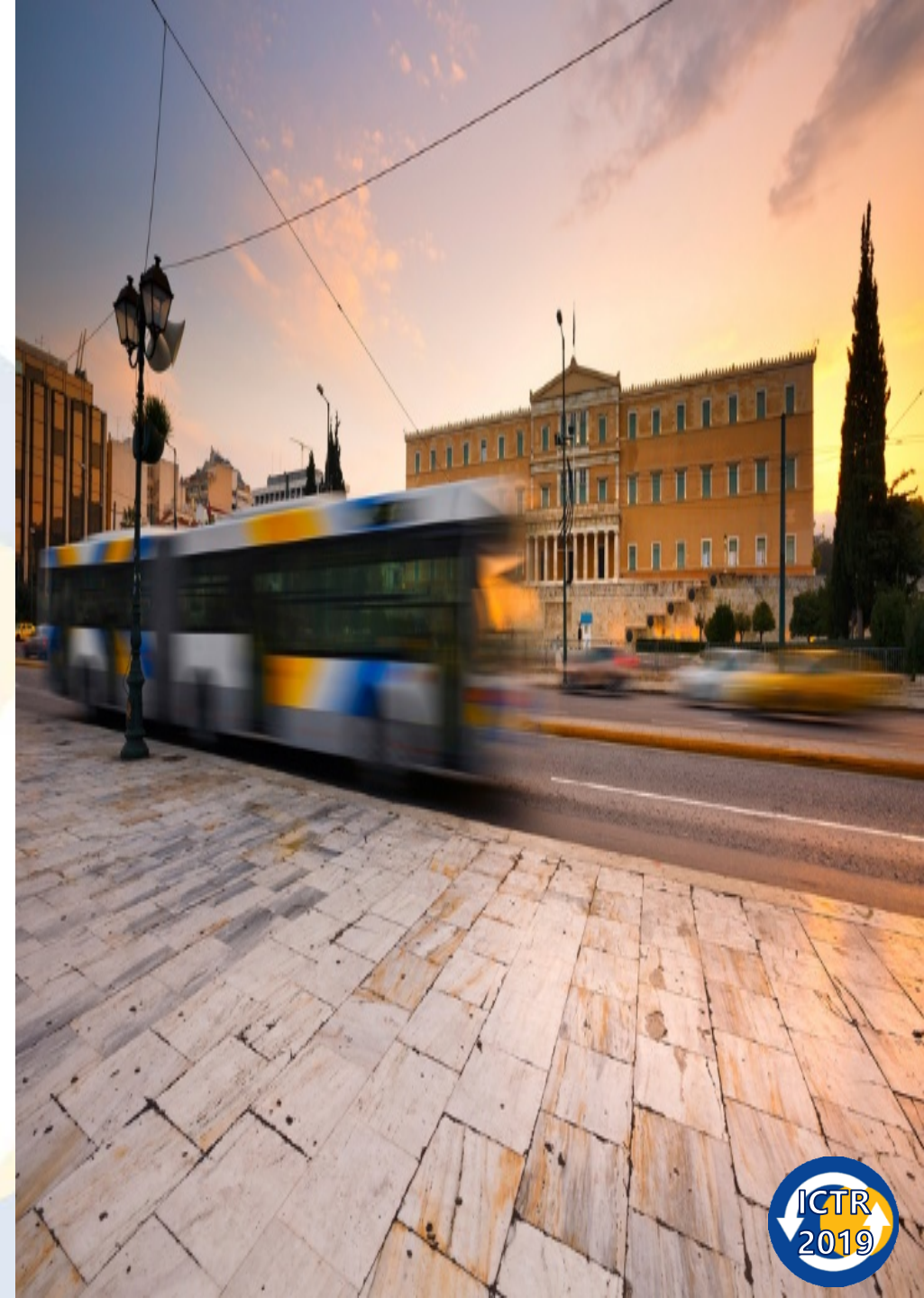
Presentation Outline

1. Objective
2. Scientific literature findings
3. SafeCulture Project (2018)
4. Factor Analysis for Grouping Variables
5. Binary Logistic Regression
6. Elasticity Analysis
7. Sensitivity Analysis
8. Conclusion
9. Future Research Suggestions



Objective

- Investigation of the **characteristics of driver aggressiveness** in Greece through perceptions on their own behavior and the behavior of other drivers
- Identification of the **factors** that cause aggressive driving
- Clarification of the term “aggressive driving” & the **driving behaviors** they characterize it
- Investigation of the relationship between aggressive driving and **driver involvement** in a road crash.



Scientific Literature Findings

- A significant proportion of drivers admits that driver aggressiveness is a **noteworthy issue**
- Young male drivers were found to be more aggressive with a history of **traffic fines** and **violations**
- Conflicts involving aggressive drivers are estimated to be **7-61% more severe** compared to normal drivers
- **Personality** has significant correlations with aberrant/deviant driving behavior
- A critical part of aggressiveness lies in what can be termed as 'driving culture' or '**road safety culture**'
- Driving culture can vary wildly in **regions** that are more distanced from each other



SafeCulture Project (2018)

The questionnaire survey conducted within the SafeCulture framework in Greece focused on **two regions**:

- Athens
- Rhodes

Questions:

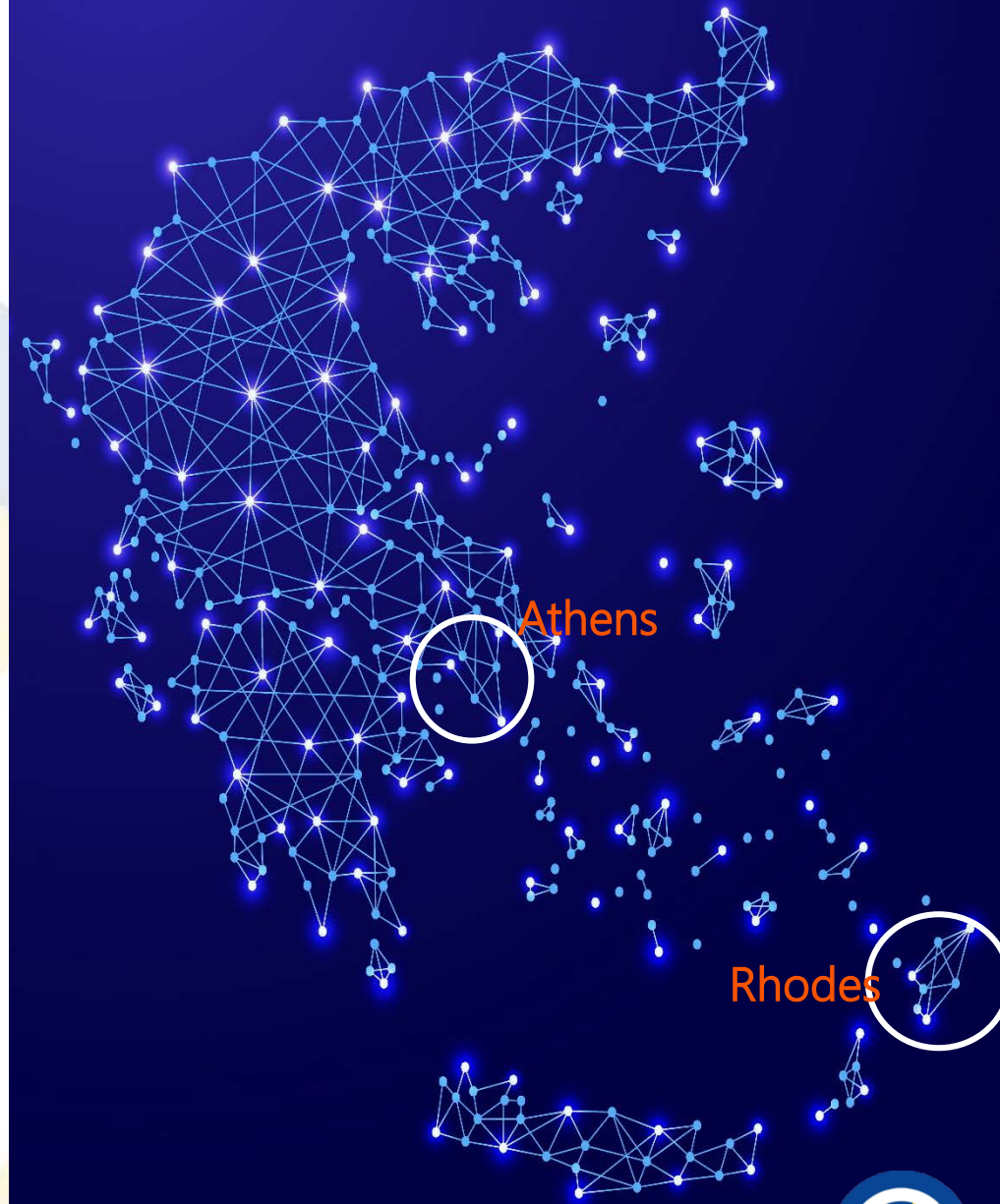
- Regarding the driver (demographics/behavior)
- Regarding the driver's friends
- Regarding driving in their country
- Regarding driving in their municipality

Main Questions:

- 5 regarding speed
- 6 regarding overtaking behaviour and aggressiveness
- 3 regarding alcohol consumption

Final sample size consisted of **503 drivers** in total:

- 302 **private car** drivers
- 201 **two-wheeler** drivers



Factor Analysis for Grouping Variables

Question Group	Question Description	KMO	Extraction	Component
Speed	When driving in Greece, I expect that other drivers do not respect speed limits on highways	0.841	0.698	0.835
	When driving in Greece, I expect that other drivers do not respect speed limits in urban areas		0.659	0.812
	When driving in Greece in my local municipality, I expect that other drivers do not respect speed limits on highways		0.611	0.788
	When driving in Greece in my local municipality, I expect that other drivers do not respect speed limits in urban areas		0.622	0.781
	How many of your regular driving friends you believe do not respect speed limits in urban areas?		0.491	0.701
Overtaking	For every 10 trips: how often do you accelerate after stopping at a traffic light to overtake vehicles next to you?	0.731	0.520	0.798
	For every 10 trips: how often do you overtake a slow driver from the internal (right) lane?		0.636	0.762
	For every 10 trips: how often do you overtake in 2-lane roads when there is no congestion?		0.581	0.721
	When driving in Greece, I expect that other drivers overtake a slow driver from the internal (right) lane		0.313	0.645
	How many of your regular driving friends you believe overtake a slow driver from the internal (right) lane		0.346	0.588
	When driving in Greece in my local municipality, I expect that other drivers overtake a slow driver from the internal (right) lane		0.416	0.559
Alcohol	When driving in Greece, I expect that other drivers drive while suspecting they are above allowed alcohol limits	0.680	0.608	0.823
	When driving in Greece, I expect that other drivers drive while suspecting they are above allowed alcohol limits		0.665	0.815
	When driving in Greece in my local municipality, I expect that other drivers drive while suspecting they are above allowed alcohol limits		0.677	0.780



Binary Logistic Regression

Binary: During the last two years, have you been involved in a road crash? (0:no 1:yes)	Coefficient b	s.e.	Wald	d.f.	Sig.	Exp(b)
exp(Factor: 'Speed')	-0.203	0.075	7.224	1	0.007	0.817
Factor: 'Overtaking'	0.331	0.144	5.310	1	0.021	1.393
Location [Athens] (Ref. Rhodes)	-0.555	0.216	6.614	1	0.010	0.574
Driving experience [>20 years] (Ref.)	-	-	14.099	2	0.001	-
Driving experience [11-20 years]	-0.870	0.245	12.613	1	0.000	0.419
Driving experience [0-10 years]	-0.445	0.218	4.158	1	0.041	0.641
Education level [up to high school] (Ref. Univ. or higher)	-0.409	0.202	4.089	1	0.043	0.664

Factor 'Overtaking'
 $b = +0.331$



According to the respondents, the factor overtaking is **positively** correlated with past crash involvement

Factor 'Speed'
 $b = -0.203$



The majority of respondents **ignore** and do not fully understand the correlation of speed with road crashes

Elasticity Analysis

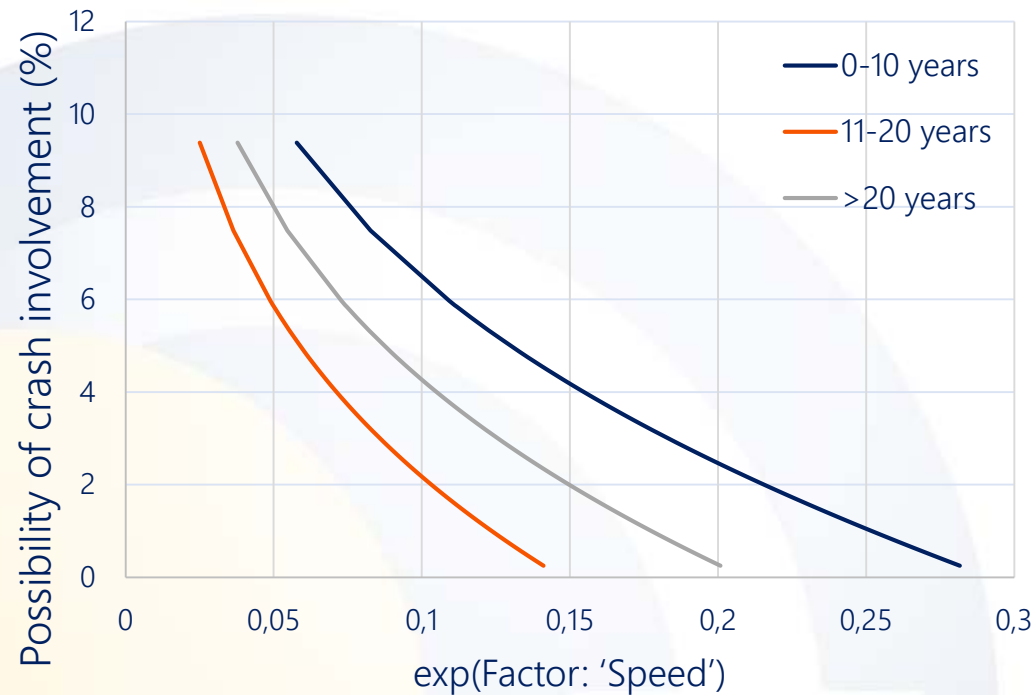
Independent Variables	CoefficientB	S.E	Wald	ei	ei*
Continuous Variables					
Location [Athens]	-0,555	0,216	6,614	-0,34	-1,36
Education level [higher education]	-0,409	0,202	4,089	-0,25	-1,00
Driving experience [11-20 years]	-0,870	0,245	12,613	-0,42	-1,68
Driving experience [0-10 years]	-0,445	0,218	4,158	-0,27	-1,08
Discrete Variables					
exp(Factor: Speed)	-0,203	0,075	7,224	0,35	35,00
Factor: Overtaking	0,331	0,144	5,310	0,01	1,00

- The **most important factor** appears to be the speed
- The second most important factor is **driving experience** from 11 to 20 years

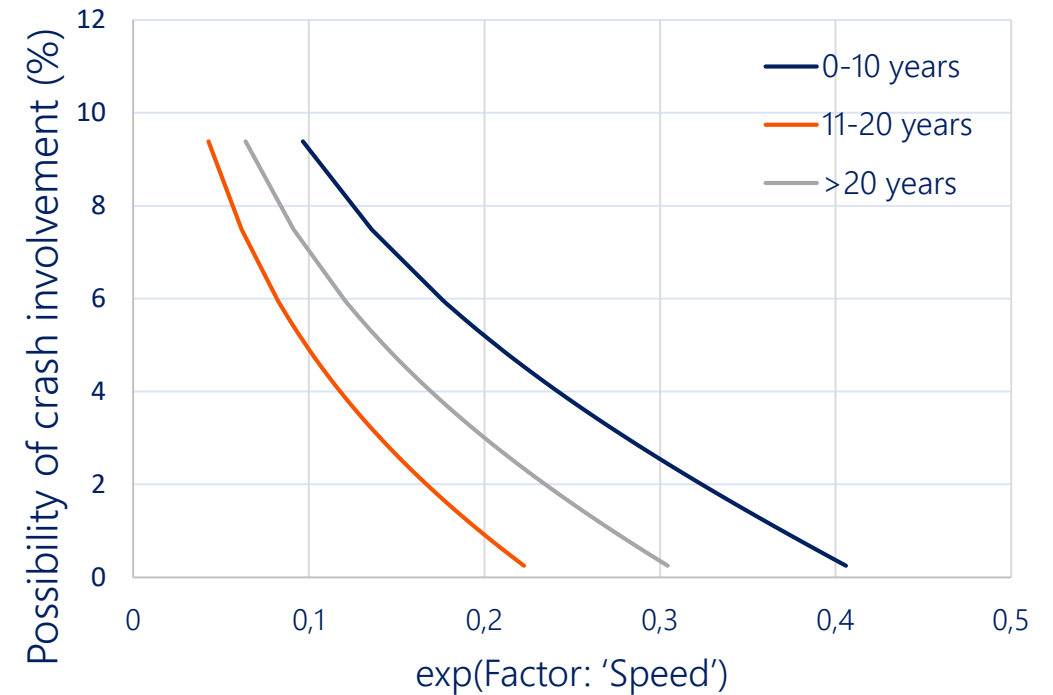
It seems that drivers, despite underestimating the dangers of speed, eventually realize the consequences indirectly. Therefore, **the danger of speeding** is not immediately perceived by road users

Sensitivity Analysis (1/2)

Driving Experience - Athens



Driving Experience - Rhodes



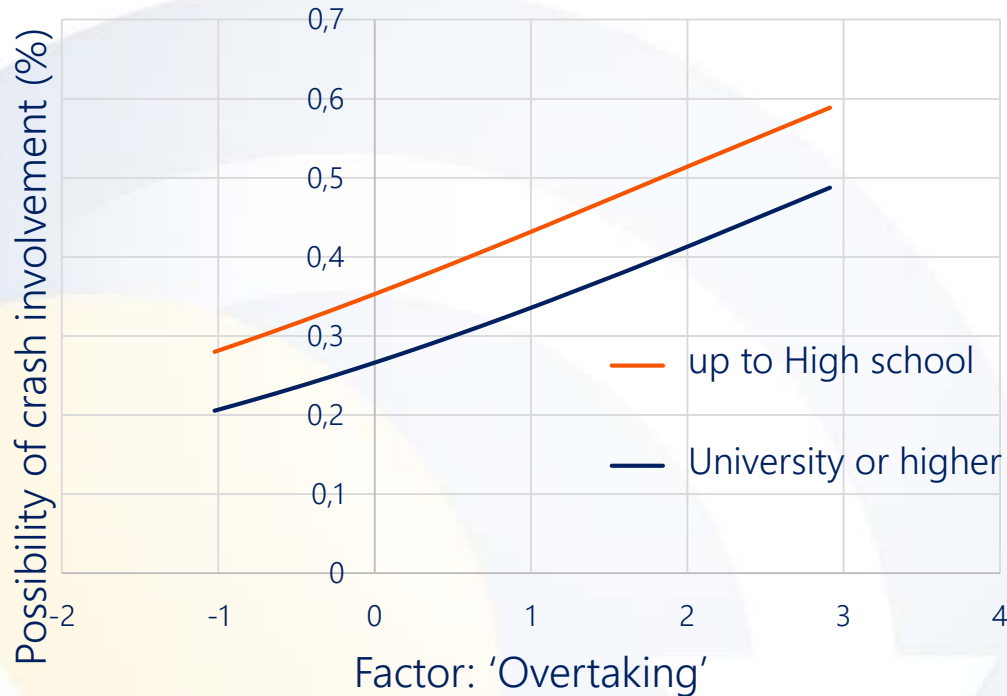
For the **specific value** of $\exp(\text{Factor: 'Speed'})$ and Driving Experience



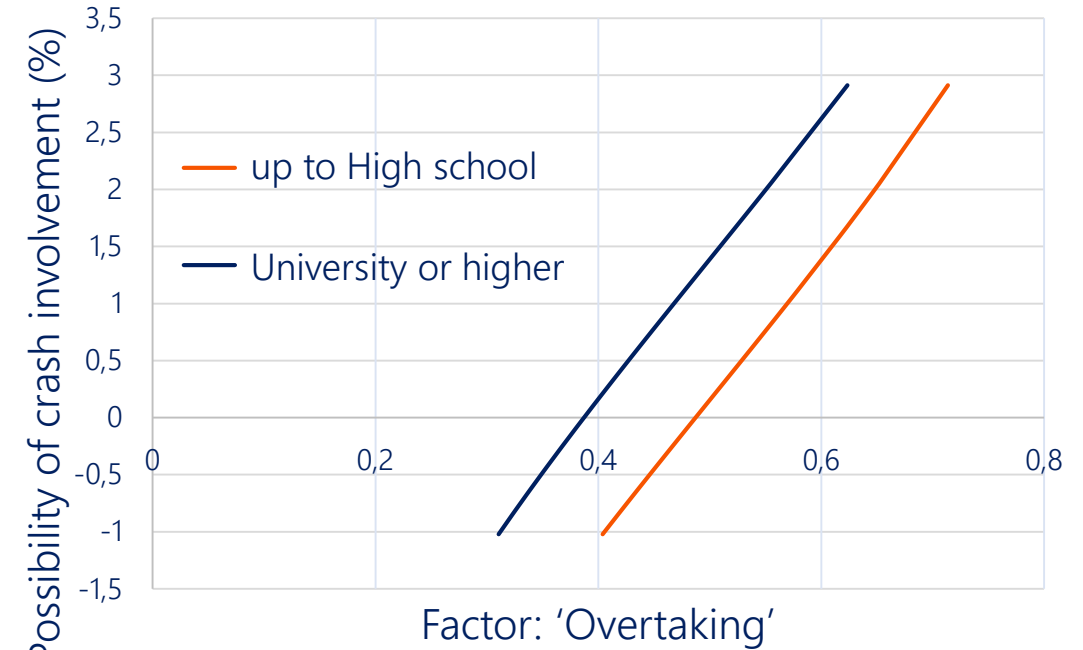
- Relative probability of crash involvement (%) in **Rhodes** > Relative probability of crash involvement (%) in **Athens**
- The relative probability of crash involvement shows a **downward trend** with respect to speed increases

Sensitivity Analysis (2/2)

Education Level-Athens



Education Level-Rhodes



For the **specific value** of Factor: 'Overtaking' and Education Level



- Relative probability of crash involvement (%) in **Rhodes** > Relative probability of crash involvement (%) in **Athens**
- The relative probability of crash involvement shows an **upward trend** with respect to overtaking increases

Conclusion

- Drivers perceive some elements of **aggressiveness** as more contributing to crash involvement than others, mainly the factor involving overtaking behavior
- The capital city of Athens was found to be perceived as a more **risky location** than the island of Rhodes
- The direct impacts of **speed** (and speeding) appear to be underestimated
- **Driver experience** was found to increase crash involvement likelihood in the past two years (probably through increased exposure)
- The impacts of **higher education** are also disregarded in the perception of drivers
- **Alcohol** was not found to be statistically significant, disregarding a lack of perception of its negative effects on road safety on behalf of drivers



Suggestions for Further Research

- Conducting research in a **larger sample** of participants and in more countries
- Applying **different methods** of statistical analysis, such as random effects between regions
- Consider **additional factors** of the SafeCulture research, such as the use of mobile phone while driving
- Develop models with the same variables for Norway but also for other countries so that comparisons can be made **between countries**





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