Social Status and Aggression in Road Traffic.
An Analysis of Horn-Honking Responses

Ben Jann and Elisabeth Coutts
ETH Zürich

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Social status and aggression in road traffic: Previous research

1. Studies experimentally manipulating the status of the frustrator (blocking car):
   - **Longer** honking latencies for a high-status frustrator (Doob & Gross 1968, Yazawa 2004)
   - **No effect** of status of the frustrator (Deux 1971)
   - **Shorter** honking latencies for a high-status frustrator (Chase & Mills 1979)
2. Study recording the status of the aggressor (blocked car), holding the status of the frustrator (blocking car) constant:
   - Higher-status aggressors had the shortest honking latencies, along with aggressors of the very lowest-status category (Diekmann et al. 1996)

Competing Hypotheses

(1) Aggression flows downward: Aggression is inhibited toward those of higher status

(2) Aggression flows outward: Aggression is inhibited toward those of the same status

First experiment, Bern, 1995

- Experimental car remains stopped after traffic light turns green => How long does it take until the driver of a blocked car sounds the horn?

- Two experimental cars: low-status (1989 Golf) and high-status (1995 Audi A6)

- N = 123

Results

	Model 1		Model 2	
Higher status frustrator	1.23	(0.95)	1.15	(0.68)
Middle status aggressor	0.79	(-0.91)		
Higher status aggressor	0.62	(-1.38)		
Small difference in status			1.38	(1.15)
Large difference in status			2.00^{*}	(2.15)
Difference in status				
Female aggressor	0.56^{*}	(-2.06)	0.64^{+}	(-1.64)
Young aggressor (18 thru 30)	1.30	(0.88)	1.46	(1.28)
Old aggressor (over 55)	1.55^{+}	(1.70)	1.71^{*}	(2.03)
Likelihood ratio: χ^{2} (*df* in brackets)	10.82^{+}	(6)	13.54^{*}	(6)

Note. Displayed are the exponents of the estimated coefficients of the Cox regression. Subtracting 1 denotes the percentage change on the hazard rate. However, *z*-values are calculated from the natural coefficients. Reference group: Lower status frustrator and lower status male aggressor between 31 and 55 years old. $N = 123$, 26 censored, $^{+}p < 0.10$, $^{*}p < 0.05$.

Results

- support for Hypothesis 2 (aggression flows outward)

- However, many problems with the experiment.
  For example: Status assessment of blocked cars based observer's subjective judgment.

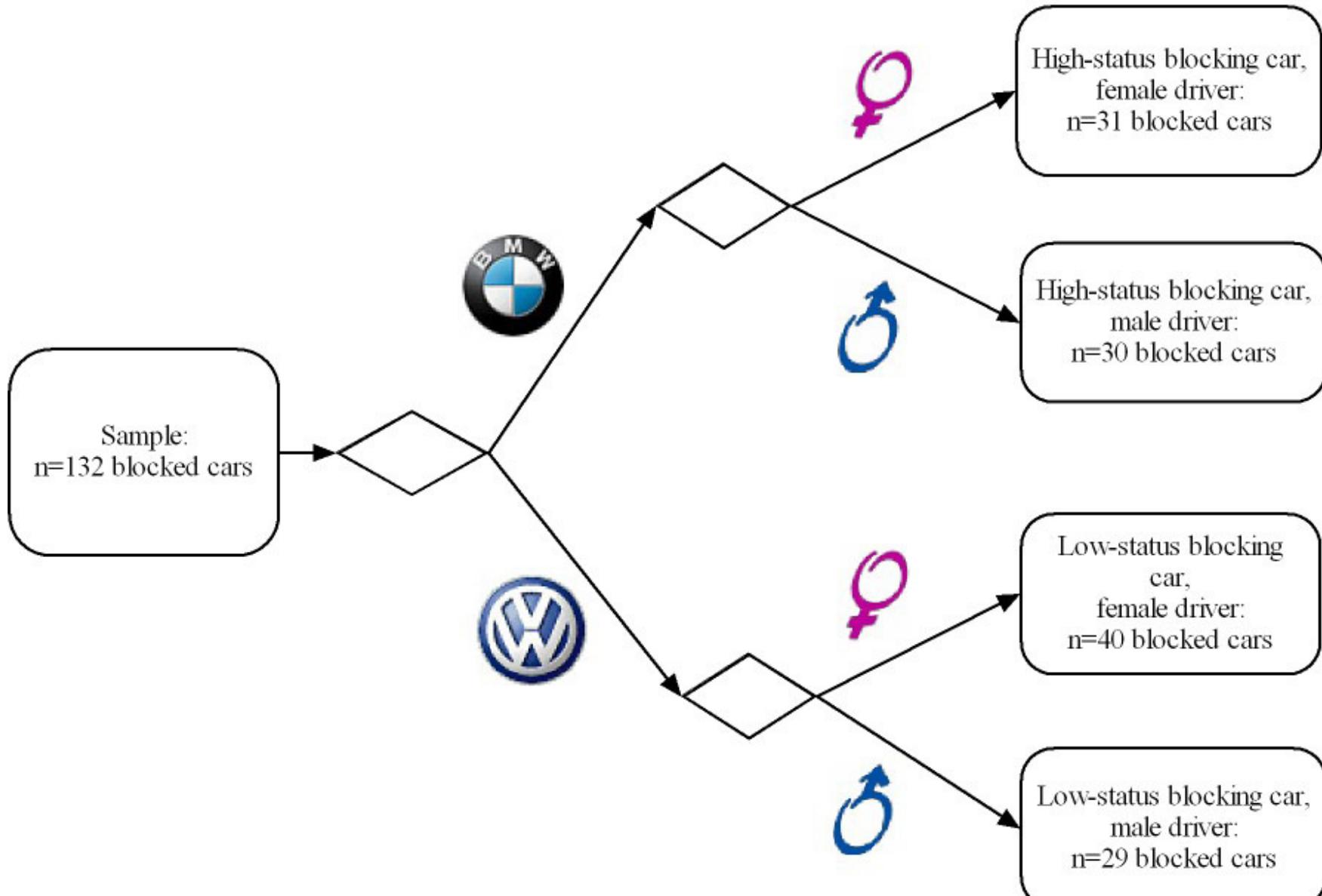- Furthermore: Some evidence that, in fact, aggression flows **upward** (Hypothesis 3)

Second experiment, in Zürich, 2005

- Experimental car blocks a side-street => How long does it take until the driver of a blocked car sounds the horn?

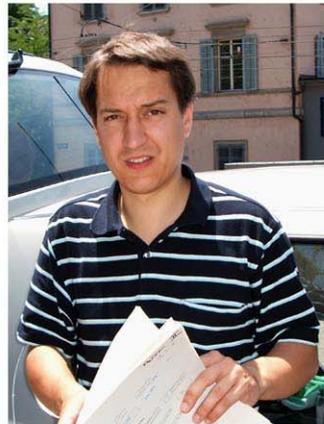- Two experimental cars: low-status (1995 Golf) and high-status (2005 BMW 530i)

Factor 1: Status of blocking car

**Factor 2: Gender of blocking driver**

Experimental Conditions

Sample: n=132 blocked cars

High-status blocking car, female driver: n=31 blocked cars

High-status blocking car, male driver: n=30 blocked cars

Low-status blocking car, female driver: n=40 blocked cars

Low-status blocking car, male driver: n=29 blocked cars

Lower-Status Condition

Higher-Status Condition

Temperature and traffic density

Temperature, Zürich, June 26, 2005 (degree celsius)

Temperature and traffic density

Hourly traffic flow, Zürich, June 26, 2005
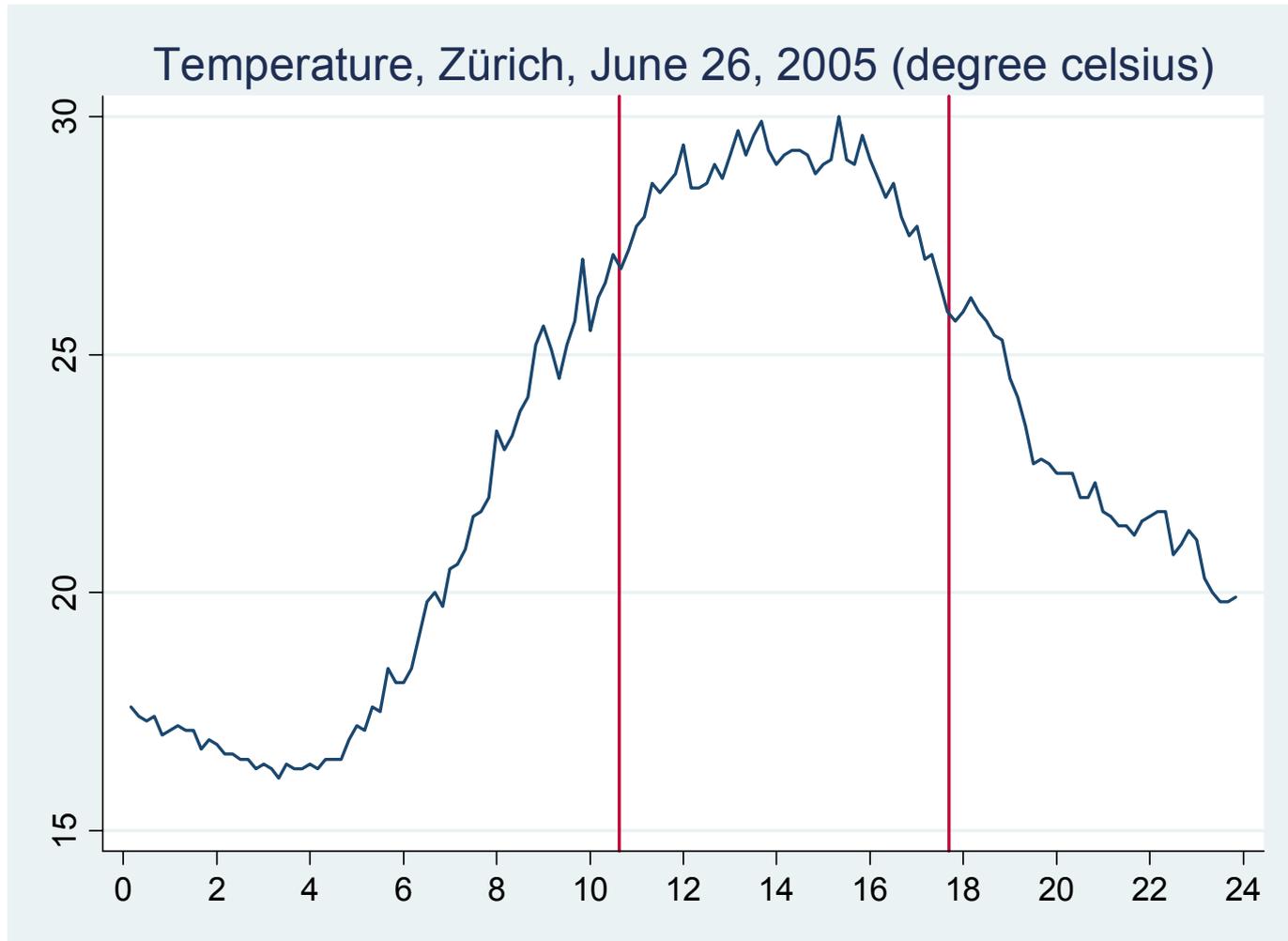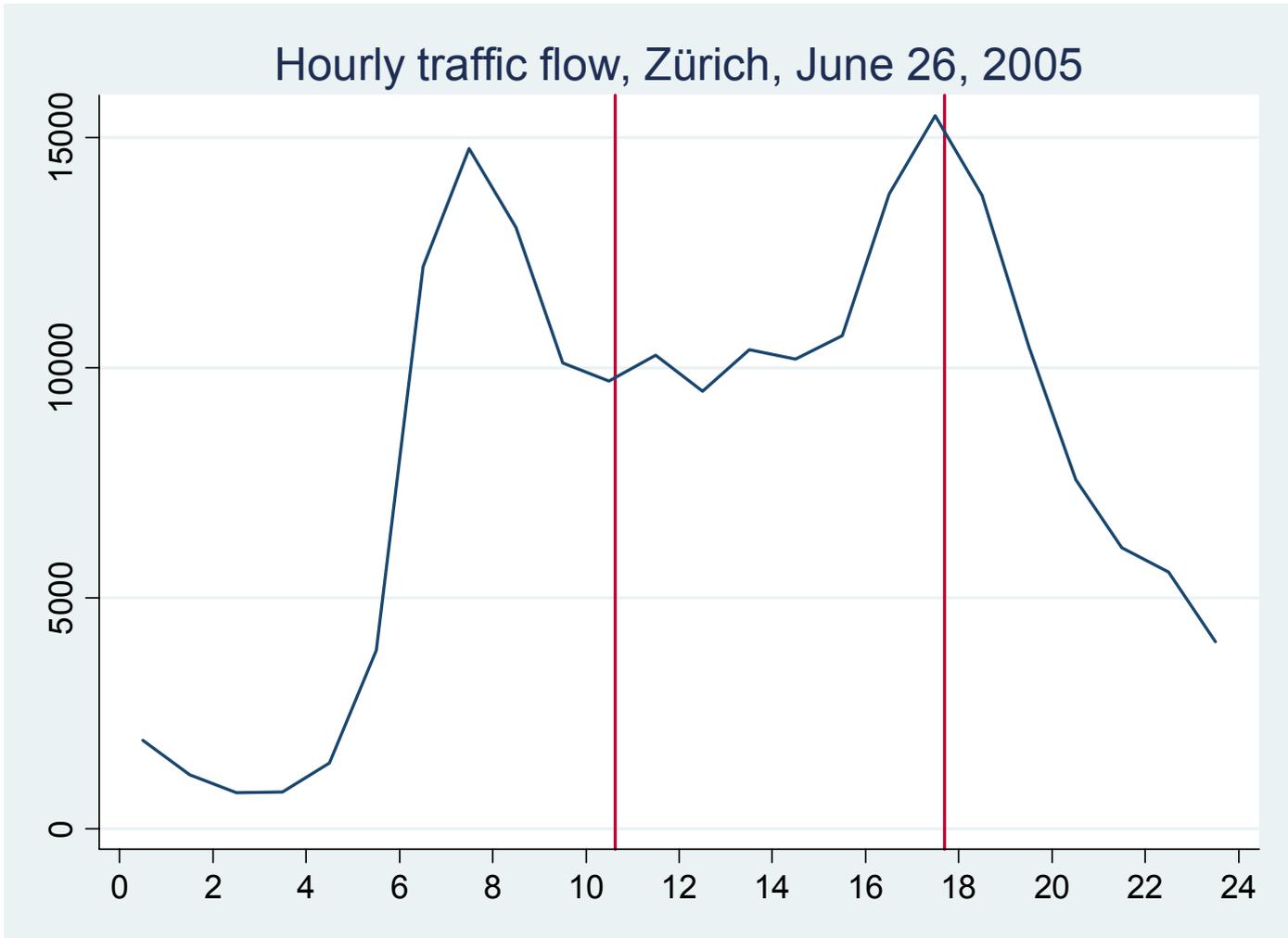
# Therefore: Alternate among experimental conditions in short time intervals
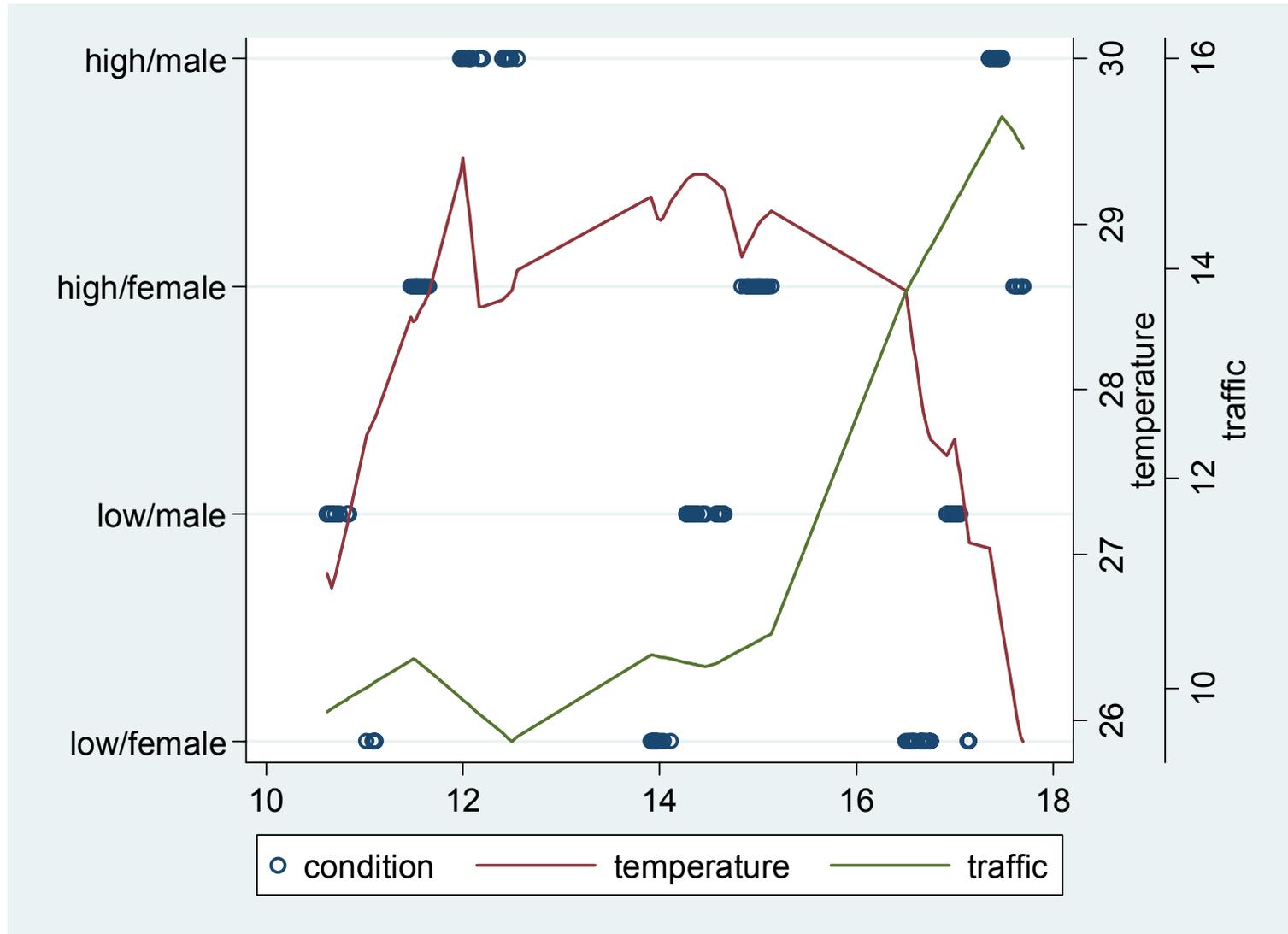
Data Collection

Two cameras and two note takers recorded:

- Honking latencies
- Characteristics of the blocked car: The model and approximate year of the (first) blocked car
- Characteristics of the blocked driver: The sex of the (first) blocked driver, his or her subjective 'status' (professional or leisure clothing, expensive looking or not, etc.), his or her aggressive or frustrated behavior (e.g. fist shaking, yelling)
- Number of blocked passengers: The number of passengers in the (first) blocked car
- Presence of other blocked cars: The number of blocked cars in total and which car honked

Data Collection
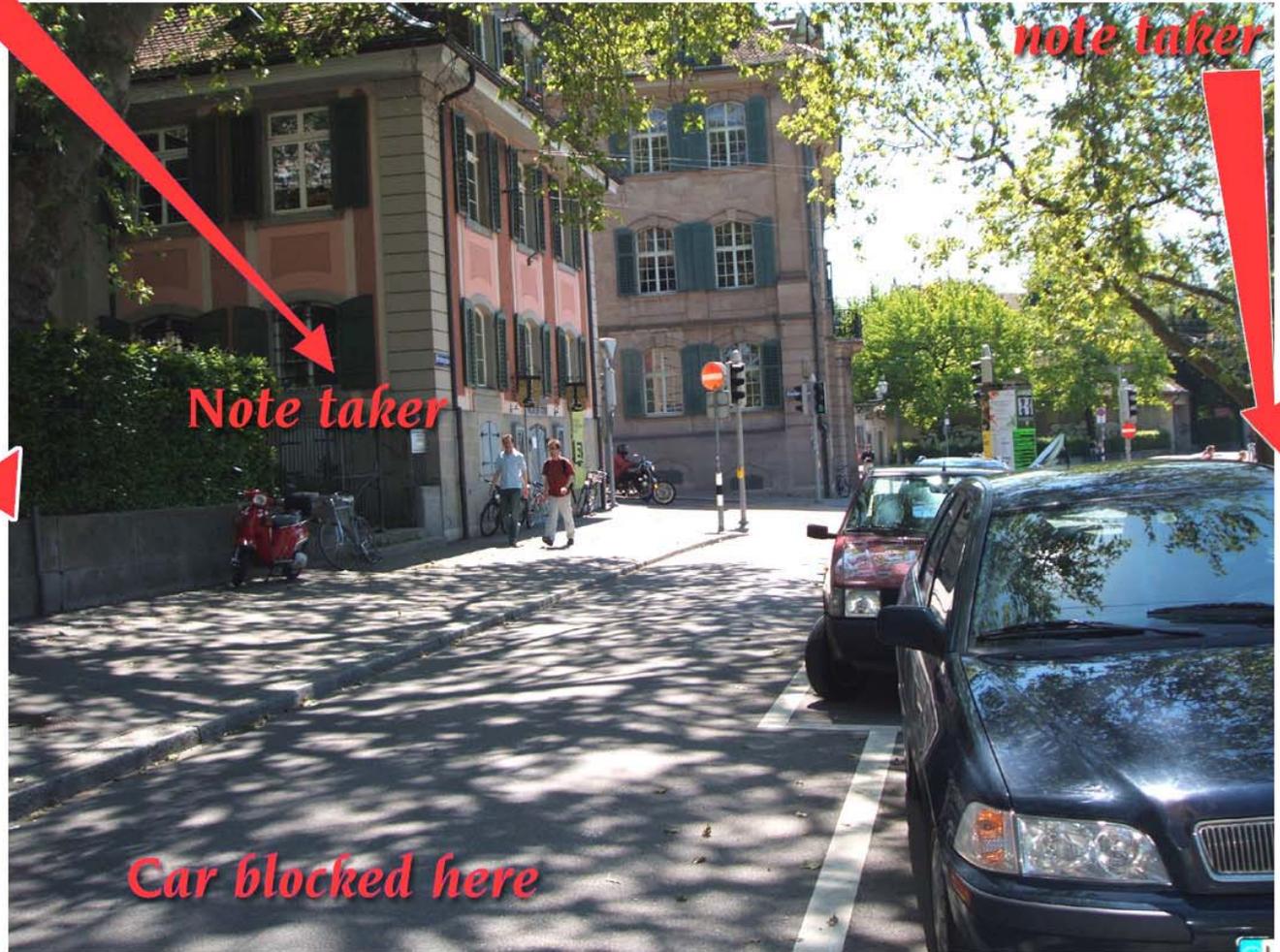
Data Collection

Examples

- [example 1](#)
- [example 2](#)
- [example 3](#)
- [example 4](#)
- [example 5](#)
- [example 6](#)
- [example 7](#)
- [example 8](#)

Much better data quality than in first experiment

- Honking latencies exactly measured using video recordings

- Identification of models of blocked cars using video recordings => possibility to measure social status based on price of car

- etc.

Results
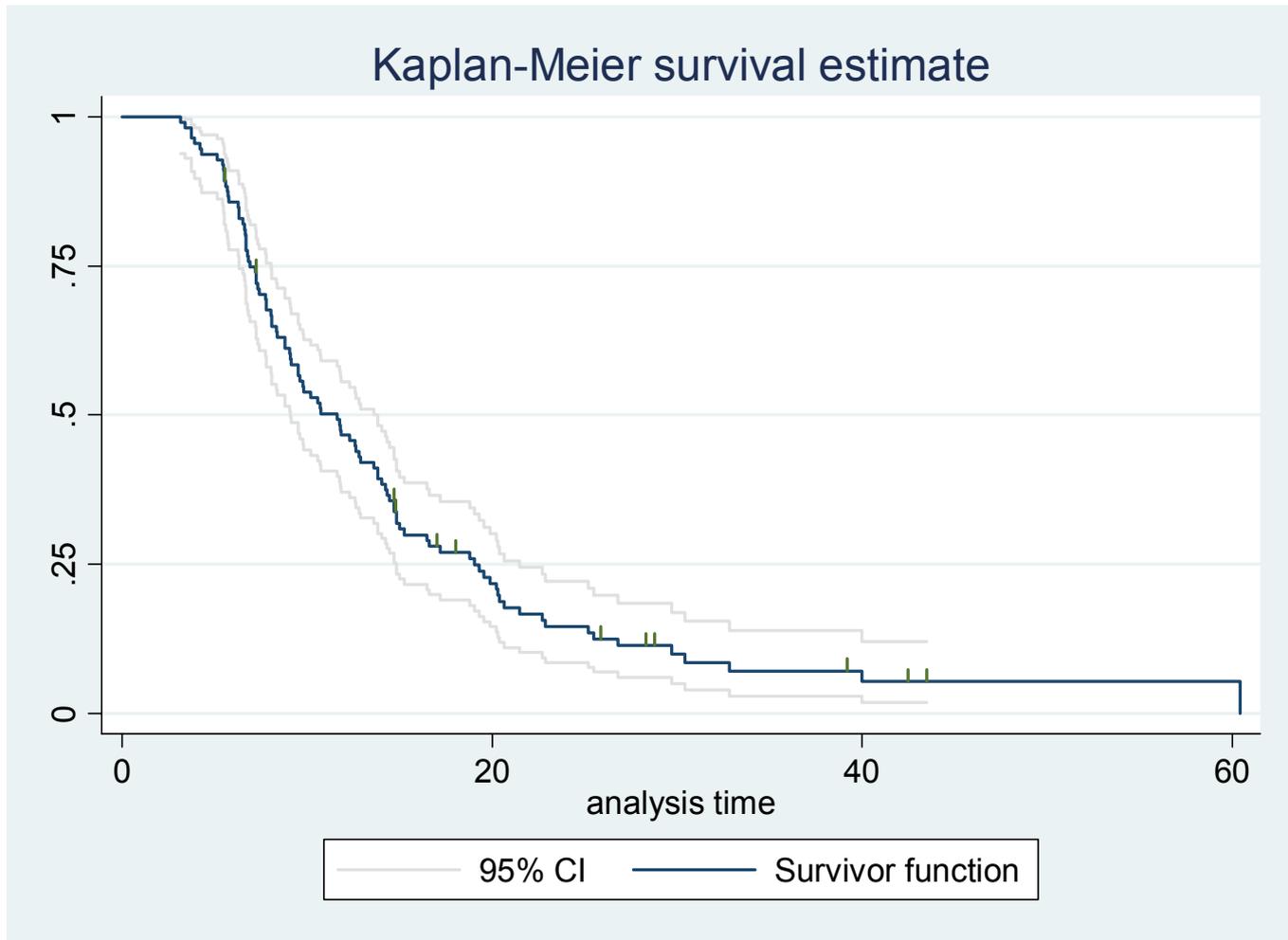
Median honking latency: 11.6 seconds

Results: experimental factors

	(1)	(2)
High status	0.997 (-0.01)	0.925 (-0.25)
Female	0.695 (-1.62)	0.645 (-1.22)
High status * female		1.160 (0.34)
N (events)	112 (100)	112 (100)

Cox regression; exponentiated; (bootstrap) t-value in parentheses

Results: subjective status judgment

	(1)	(2)	(3)	(4)
|Δ status|	1.187 (1.24)		1.388 (1.78)	
+ Δ status		0.879 (-0.53)		1.088 (0.32)
- Δ status		1.582* (2.40)		1.787* (2.04)
p-value Δ +/-		0.0451		0.239
N (e)	104 (93)	104 (93)	104 (93)	104 (93)
Controls	No	No	Yes	Yes

Cox regression; exponentiated; (bootstrap) t-value in parentheses; controls are: status frustrator, traffic, temperature, age and sex of driver, etc.

Results: price as status measure

	(1)	(2)	(3)	(4)
|Δ price|	1.016 (1.74)		1.028* (2.20)	
+ Δ price		1.020 (0.92)		1.042 (1.70)
- Δ price		1.012 (1.31)		1.014 (0.72)
p-value Δ +/-		0.741		0.401
N (e)	112 (100)	112 (100)	112 (100)	112(100)
Controls	No	No	Yes	Yes

Cox regression; exponentiated; (bootstrap) t-value in parentheses; controls are: status frustrator, traffic, temperature, age and sex of driver, etc.

Conclusions

- Not much evidence for Hypothesis 1 (aggression flows downward)

- Some evidence for Hypothesis 2 (aggression flows outward)

- Results from both experiments are somewhat inconclusive. However, there are also parallels
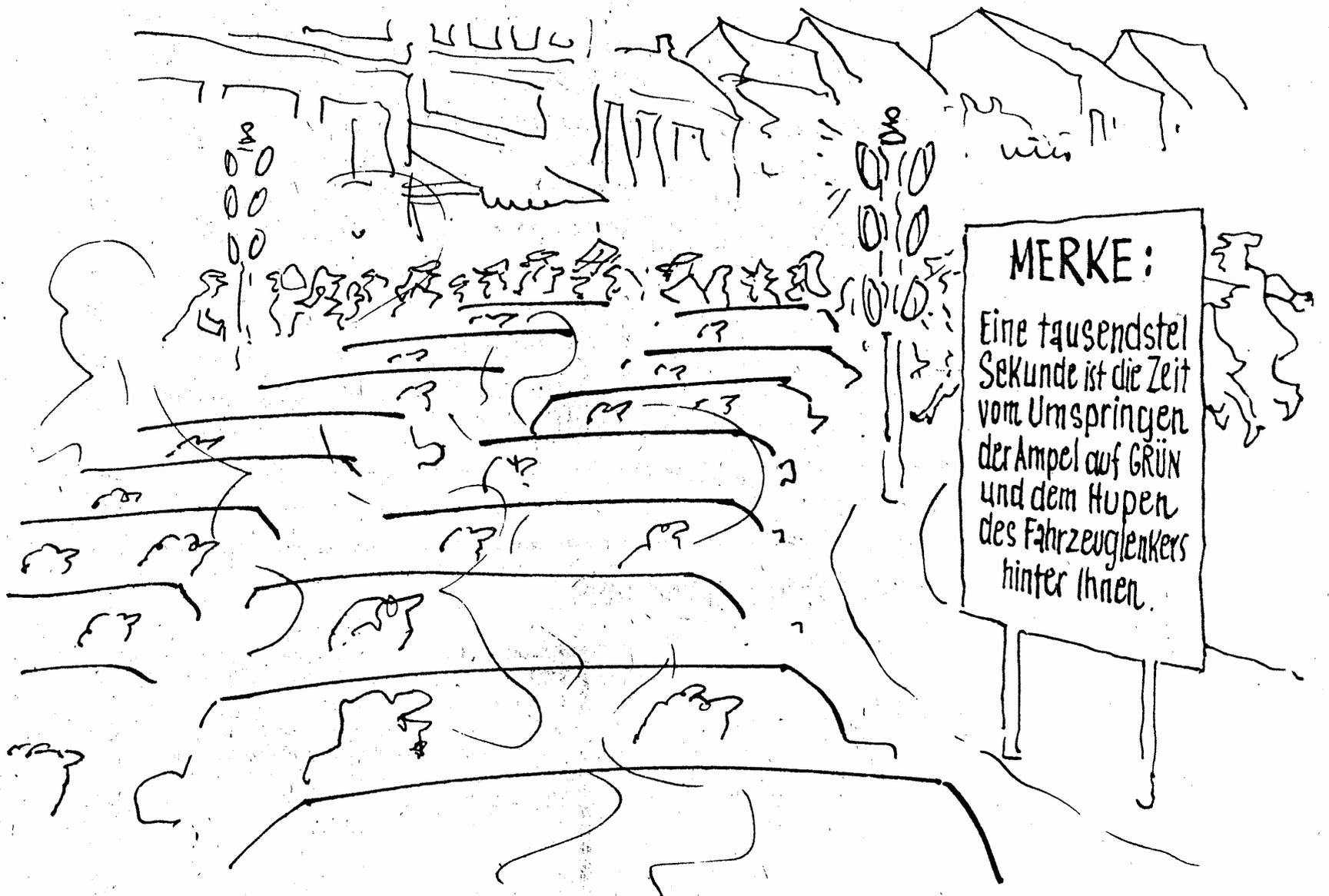
MERKE:

Eine tausendstel Sekunde ist die Zeit vom Umspringen der Ampel auf GRÜN und dem Hupen des Fahrzeuglenkers hinter Ihnen.

Lothar Ursinus