

# Relative crash involvement risk associated with various distraction factors

First International Conference on Driver Distraction and Inattention, September 28<sup>th</sup> and 29<sup>th</sup> , 2009  
Chalmers, Gothenburg  
Agathe Backer-Grøndahl\* and Fridulv Sagberg

# Outline

- Background
- Methods
- Quasi-induced exposure
- Results
- Discussion of results

# Background

- 3 types of scientific studies

- 1) ...effect on driving behaviour

- Experiments
- Low external validity

- 2) ...prevalence of distraction factors in crashes

- Distraction contributes to 8 – 25 percent of crashes
- Lacks exposure data

- 3) ...crash risk studies

- Difficult to gain good exposure data
- Quasi-induced exposure?

# The present study

- *Explore* one means to estimate *relative crash risk*
- Quasi-induced exposure
- Self-report of distraction factors

# Methods – participants and procedure

- TØI and Gjensidige (insurance company)
- 33 000 *accident involved* drivers
- Web-based survey
- Paper version optional

# Methods – participants and procedure

- N=6111
- Response rate: 18 %
- Low response rate
- Underrepresentation in study sample
  - Males (61 % versus 64 %)
  - Young drivers ( $M_{\text{(study sample)}}=48$ ,  $M_{\text{(gross sample)}}=47$ )
  - At-fault drivers (54 % vs. 62 %)
- N=4703 multiple vehicle accidents

# Methods – measures

- Background variables (age, sex, years with driver license etc.)
- Various (potential) risk factors:
  - Health conditions
  - Mobile phone use
  - And....

# Methods – measures

*“Was there anything else inside or outside the car that disturbed or distracted you prior to the accident?”*

- Conversation with passenger
- Children in the back seat
- Bug/insect inside the car
- Smoking
- Eating/drinking
- Billboard outside
- Searching for addresses
- Map reading
- Adjusting CD/iPod etc.
- Radio tuning
- Object inside car
- Adjusting other in-vehicle equipment
- Other distraction (free text field)



# Methods – quasi-induced exposure

- Culpability in accident
  - At-fault
  - Not-at-fault
- Prevalence of the risk factor (distraction factor) is the same among not-at-fault drivers as in the driver population in general

## Methods – quasi-induced exposure

$$RR = \frac{\frac{\text{(At-fault drivers with distraction present)}}{\text{(Total number of at-fault drivers)}}}{\frac{\text{(Not-at-fault drivers with distraction present)}}{\text{(Total number of not-at-fault drivers)}}}$$

# Methods – quasi-induced exposure

$RR > 1$  = increased accident risk

$RR = 1$  = no difference in accident risk

$RR < 1$  = decreased accident risk

# Results

- 15 % of at-fault drivers were distracted by one or several factors
- Conversation with passenger(s)
- Attending to children (significantly more women)

# Results

	Percentage of drivers being distracted by each factor			
Variables	At-fault n= 1785	Not-at-fault n=2522	RR	95 % CI
Talking with passengers				
Attending to children i back seat				
Billboard outside				
Searching for address/street name				
Adjusting CD/iPod etc.				
Radio tuning				
Moving object inside car				
Adjusting in-car equipment				

# Results

	Percentage of drivers being distracted by each factor			
Variables	At-fault n= 1785	Not-at-fault n=2522	RR	95 % CI
Talking with passengers	8.07	1.55	5.22	3.68-7.39
Attending to children i back seat	3.81	0.67	5.65	3.33-9.58
Billboard outside	0.67	0.04	16.95	2.19-130.28
Searching for address/street name	1.23	0.08	15.54	3.66-66.1
Adjusting CD/iPod etc.	1.29	0.20	6.50	2.48-17.06
Radio tuning	0.78	0.08	9.89	2.25-43.46
Moving object inside car	0.62	0.04	15.54	2.01-120.28
Adjusting in-car equipment	0.67	0.20	3.39	1.20-9.61

# Results

			Percentage of drivers being distracted by each factor			
Variables	Exp (B)	p	At-fault n= 1785	Not-at-fault n=2522	RR	95 % CI
Age	<b>0.69</b>	.001				
Talking with passengers	<b>4.85</b>	.001	8.07	1.55	5.22	3.68-7.39
Attending to children in back seat	<b>4.68</b>	.001	3.81	0.67	5.65	3.33-9.58
Billboard outside	<b>15.32</b>	.01	0.67	0.04	16.95	2.19-130.28
Searching for address/street name	<b>12.10</b>	.001	1.23	0.08	15.54	3.66-66.1
Adjusting CD/iPod etc.	<b>5.50</b>	.001	1.29	0.20	6.50	2.48-17.06
Radio tuning	<b>6.67</b>	.05	0.78	0.08	9.89	2.25-43.46
Moving object inside car		ns	0.62	0.04	15.54	2.01-120.28
Adjusting in-car equipment	3.04	ns	0.67	0.20	3.39	1.20-9.61

# Results

			Percentage of drivers being distracted by each factor			
Variables	Exp (B)	p	At-fault n= 1785	Not-at-fault n=2522	RR	95 % CI
Age	<b>0.69</b>	.001				
Talking with passengers	<b>4.85</b>	.001	8.07	1.55	5.22	3.68-7.39
Attending to children in back seat	<b>4.68</b>	.001	3.81	0.67	5.65	3.33-9.58
<b>Billboard outside</b>	<b>15.32</b>	<b>.01</b>	<b>0.67</b>	<b>0.04</b>	<b>16.95</b>	<b>2.19-130.28</b>
<b>Searching for address/street name</b>	<b>12.10</b>	<b>.001</b>	<b>1.23</b>	<b>0.08</b>	<b>15.54</b>	<b>3.66-66.1</b>
Adjusting CD/iPod etc.	<b>5.50</b>	.001	1.29	0.20	6.50	2.48-17.06
Radio tuning	<b>6.67</b>	.05	0.78	0.08	9.89	2.25-43.46
Moving object inside car		ns	0.62	0.04	15.54	2.01-120.28
Adjusting in-car equipment	3.04	ns	0.67	0.20	3.39	1.20-9.61



# Discussion

- Outside-vehicle distractions
- In-vehicle distractions
- Limitations
  
- Future research?
  - Naturalistic driving observation

Thank you!  
[abg@toi.no](mailto:abg@toi.no)