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Pedestrian and driver encounters, communication and decision strategies

Part I: Focus groups analysis

Matus Sucha

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1a. General information about the University

Palacky University in Olomouc (*Universitas Palackiana Olomucensis)* is the oldest university in Moravia and the second oldest in the Czech Republic.

It is now a modern educational institution comprising **eight faculties** that provide instruction **to 23,000 students** in all fields of study relevant to the present-day scientific activities and the needs of practice.

1. Aims

Aim of this work is to **describe pedestrian and driver encounters, communication and decision strategies** on the marked crossings.

And, to identify factors (accounting pedestrians, drivers, design of road system), which **may lead to risky situations and accidents**.

1. Further more aim is to describe:

- Pedestrian behavior before and while crossing the road at marked crossing (and when car is approaching).

- Driver behavior while approaching marked crossing when pedestrian is present at side walk, or when starting to cross.

- Pedestrian strategies to cross the road at marked crossing and driver strategies of driving while approaching marked crossing when pedestrian is present.

- Pedestrian - driver communication (such as eye contact, gestures, verbal expressions, and signals, such as the flashing of lights..) at situations before and while crossing at marked crossings.

2. Theoretical background

- Theory of subjective and objective safety (Mendelsohn, 1964).
- Lurie (1968) – Game theory perspective (Formal and informal norms)
- Theory of social imitation / Social learning theory (Bandura, 1969)
- Theory of learned helplessness (Seligman, 1975)
- Risk homeostasis theory (Wilde, 1976)
- Threat avoidance Model (Fuller, 1984) – model implies defensive driving concept.
- Theory of planned behavior (Ajzen, 1985)
- Himanen and Kulmala (1988) – A multinomial logit model
- Situational awareness (Endsley, 1999)
- Zaidel theory (1992)

3. Study design

Mixed methods study design.

1. **Exploration of pedestrian and driver needs and conflict situations (identification of problem) – focus groups with pedestrians and drivers (separately) – 4 FG (2+2)**

2. Pilot study (spots, questionnaire, observation sheet, camera recordings)

3. Data collection – observation (data from cameras, on site observation (2 observers – driver/ pedestrian), speed measurement), interviews (on site rapid interviews with pedestrians)

4. Exploration and generalisation – expert workshops

4. Recent developments and outcomes

Focus groups analysis – pedestrians:

General:
"Pedestrians have no rights, always waiting somewhere, annoying drivers."

1. Factors which pedestrians consider when deciding to wait/go:
speed of the approaching vehicle, distance of the vehicle (safety gap), vehicle deceleration, eye contact, familiarity of the place, view conditions, traffic density.

2. What pedestrians consider as a risky situation:
high traffic density, high vehicle speeds, crossings without traffic lights, short pedestrian green phase, spots without crossings, crossings including tram, turning vehicles when green pedestrian light, crossings near roundabouts, car passing near pedestrian (just after his/her crossing), cyclists on the crossing, small refugee islands, bad view conditions, 2nd vehicle yielding, drivers distraction.

4. Recent developments and outcomes

Focus groups analysis – pedestrians:

3. Protective factors/ countermeasures:
Humps, narrow roads, enforcement (presence of the police), all crossing equipped with traffic lights.

4. Means of communication pedestrians to drivers:
Eye contact (gazing/ staring), glimpse of movement to the road, waving with hand. Saying "Thank you" – waving with hand, smile, wag with the head.

5. Means of communication drivers to pedestrians:
Flashing with lights, waving with hand.

Focus groups analysis – drivers:

General:

Mostly talking about infrastructure and vehicle equipment (safety systems).

"It`s about toleration and respect. Pedestrians want to feel superior, not wanting to respect driver and wanting to make him stop".

1. <u>What drivers consider as a risky situation/behavior/pedestrian`s groups:</u>

- *pedestrian running to catch the tram, pedestrian with earphones, jaywalking (red lights, not on the crossing), sudden/unexpected pedestrian`s movement (stop/go), pedestrian not paying attention to traffic/vehicles, pedestrians pretending they don`t see car approaching, pedestrians not prizing their lives*

- *elderly pedestrians (jaywalking, not paying attention),kids, mothers with prams, runners, rollerbladers, handicapped, drunken pedestrians*

- *pedestrian`s zones, low pedestrians visibility, bad view conditions (e.g. barriers at tram stops), turning right/left when pedestrians have green, cyclists on the crossings*

4. Recent developments and outcomes

Focus groups analysis – drivers:

2. Protective factors/ countermeasures:

Crossings with traffic lights, more crossings, humps, refugee islands, lights on the crossings, narrow streets, clearly and well marked crossings, mutual driver/pedestrian respect.

3. Means of communication:

Flashing with lights, waving with hand, eye contact = showing "you can go".

4. What to do to force pedestrian to stop:

Not to decelerate, to speed up, obey eye contact, driving more in the center of the road (to avoid hitting pedestrian).

4. Recent developments and outcomes

Focus groups analysis – drivers:

5. Yielding to pedestrians:

Not giving priority to pedestrians: when traffic densities are low ("I consider safety of pedestrian and traffic flow.", "I don`t stop so that I don`t slow down traffic flow"), when looking at fuel consumption, when too close to the crossing (emergency breaking), when pedestrian doesn`t start to cross and waits, when expected that pedestrian will be slowly moving, when place is familiar, when pedestrian takes a look and notice driver, when more crossings in a row, when other vehicle (in opposite direction) won`t stop, with growing distance from city center the willingness to yield decline.

Giving priority to pedestrians:
when disturbed (SMS, phoning etc. – to have more time), depends on the pedestrian group (kids, mothers with pram), when pedestrian is "on the move" (won`t stop before crossing).

5. Next steps, discussion and open questions

1. Analysis of accident data (2010-2013) – identification of hotspots and accident types
2. Pilot study – 1 or 2 spots, observation, interview (sheets check), camera recordings (analysis of recorded material), get to know story of the place
3. Identification of spots (zebra crossings) where observation, interviews, camera recording and speed measurement will be conducted
4. Data collection and analysis (observation, interview, camera recording, speed measurement)
5. Exploration/ generalistaion – Expert workshops
6. Publication and next research

5. Next steps, discussion and open questions

Spot chosen for pilot study:
Single crossing, narrow street, no traffic lights, 3 accidents with pedestrians in last 3 years, high densities of pedestrians and traffic.

5. Open questions

1. **Spots selection for research**
    1. Crossings with /without traffic lights?
    2. No. of spots

2. **Time of observation and conditions?**
    1. Low and high volume of traffic (Morning, afternoon)
    2. Visibility (night, rain)

3. **Focus on the core aim of the research = <u>communication</u> between pedestrians and drivers and <u>encounter description</u> when meeting at zebra crossings.**
    1. Less structured situations is better
    2. Not too complicated/ complex situations

4. **Respondents for interview/ observed persons (sampling)?**
    1. How to choose and how many? Quotas?

Key literature

- Varhelyi, A. (1998). Drivers` speed behavior at a zebra crossing: a case study. Accident analysis and prevention, 30, 6, 731-743. Elsevier.

- Björklund, G. (2005). Driver Interaction – Informal rules, Irritation and Aggressive Behaviour. Digital Comprehensive Summaries of Uppsala Dissertations from the Faculty of Social Sciences 8. Uppsala Universitet.

- Himanen, V. & Kulmala, R. (1988). An application of logit models in analyzing the behavior of pedestrians and car drivers on pedestrian crossings. Accident Analysis & Prevention, 20, 3, 187-197. Elsevier.

Thank you for listening!

Questions?