



Using explicit and implicit attitudes to predict driving aggression triggered by frustration

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Maladaptive driving

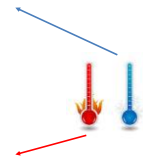
Most road crashes (90-95%) ascribed to the human driving behavior

Cold state

Without the intention to harm

Hot state

Prone to behave aggressively to others



Aggressive driving

Many definitions

In general, behavior:

- ✓ Causing (potential) physical or emotional damage to other road user(s)
- ✓ Consisting of a violation or deviation from the norm

✗ ~ Road rage/risky driving



Examples of aggressive driving

- Driving at excessive speed
- Weaving in and out of lanes
- Running through red lights or stop signs
- Tailgating
- Chasing other drivers
- Angry gestures or language
- ...



What causes aggressive driving?

Related to the individual

Age, sex, general aggression, sensation seeking, ADHD, ...

Related to the situation

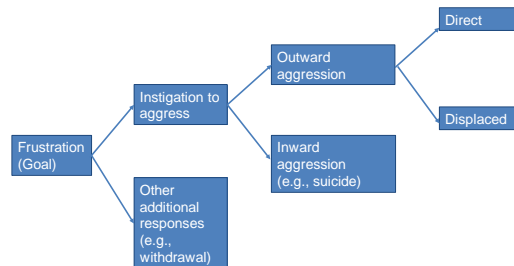
Response to the behavior of others or to the environment

Steered by emotional states of anger or frustration

E.g., When own goals are blocked



Frustration - aggression model

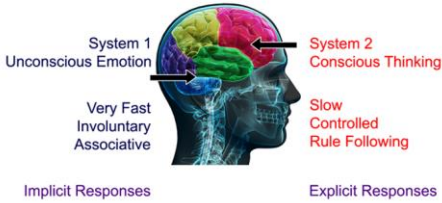


(Dollard e.a., 1939; Miller, 1941; Myers e.a., 2010)



Neurological base of aggression

Two Decision Making Routes



Measuring aggression

Explicit

Questionnaires = self-report
E.g., Driver Anger Scale

Implicit

(Computer)tasks = unconscious
E.g., Implicit Association Task (IAT)



Research question

Usefulness of explicit and implicit measures in predicting aggressive driving triggered by frustration?

Sample: 60 male drivers (18-45 years old)



Procedure

1. Explicit and implicit measures of driving and aggression
2. Anger induction to induce an emotionally loaded situation
 - Increased predictability of explicit and implicit measures?
 - Age was distributed evenly across two induction groups (neutral and anger)
3. Simulated driving scenario including a frustrating event



Explicit measures

General aggression: Buss-Perry Aggression Questionnaire
E.g., Some of my friends think I am a hothead

General driving behavior: Driver Behavior Questionnaire
E.g., Disregard speed limit on residential road

Aggressive driving: Driving Anger Scale
E.g., Someone weaving in and out of traffic

Sensation seeking: Arnett Inventory of Sensation Seeking
E.g., When I listen to music, I like it to be loud. (Intensity)



Implicit measure

Single-Target Implicit Association Test (ST-IAT)

Conditions pairing self with peaceful or aggressive words

Categorization reaction times are compared

Positive outcome = stronger association between the self and aggression



Anger induction

50% Anger condition

Think about and describe the last event that angered you

50% Neutral condition

Describe a regular week planning



Driving simulator



Driving scenario & measures

Situation 1 (manipulation check)

Neutral right-of-way situation

Measures: right-of-way, distance between vehicles



Driving scenario & measures

Situation 2 (Abou-Zeid et al., 2011)

Frustrating event: slow bus

Measures: min. TTC, min. distance and speed at that min. distance



Driving scenario & measures

Situation 3 (Abou-Zeid et al., 2011)

Two consecutive yellow lights

Measures: # times stopped



Driving scenario & measures

Situation 4 (Abou-Zeid et al., 2011)

Left turn with short gaps between vehicles and a honking following vehicle

Measures: # accepted gaps



Results

Anger induction

Significant in situation 4

Increased gap acceptance (reversed effect)



Trend expected effect in some measures (e.g., anger group → gave less right-of-way)



Results

Aggressive driving lower in older men

Predictability explicit and implicit measures (backward regression)

More significant predictors in the anger group

Explicit measures were better predictors

Driving behavior questionnaire and Buss-Perry aggression questionnaire!

ST-IAT only for min. TTC (and reversed!)



Discussion and recommendations

Small n

Limitations experimental set-up?

Ecological validity driving simulation

True measures of aggression?

Overestimation link frustration-aggression?

Lack of effects anger induction

Transfer to other room after interview → cancelling effect?

Use other techniques (e.g., harassment)



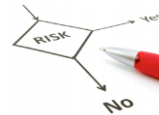
Discussion and recommendations

Implicit measures useful?

Related to reactive or proactive aggression?

Investigate other measures → e.g., E-Stroop

Potential explicit measures for predicting aggression in emotional laden situations



Additional questionnaires?



Questions/comments?

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