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

X ~ Road rage/risky driving

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

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
• ...

Frustration - aggression model

(Dollard e.a., 1939; Miller, 1941; Myers e.a., 2010)
Neurological base of aggression

Two Decision Making Routes

System 1
Unconscious Emotion
Very Fast
Involuntary
Associative

System 2
Conscious Thinking
Slow Controlled
Rule Following

Implicit Responses
Explicit Responses

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 \(\rightarrow\) gave less right-of-way)

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 \(\rightarrow\) cancelling effect?
Use other techniques (e.g., harassment)

Discussion and recommendations

Implicit measures useful?
Related to reactive or proactive aggression?
Investigate other measures \(\rightarrow\) e.g., E-Stroop

Potential explicit measures for predicting aggression in emotional laden situations

Additional questionnaires?

Questions/comments?

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