What are the links between trust, acceptability, and acceptance?

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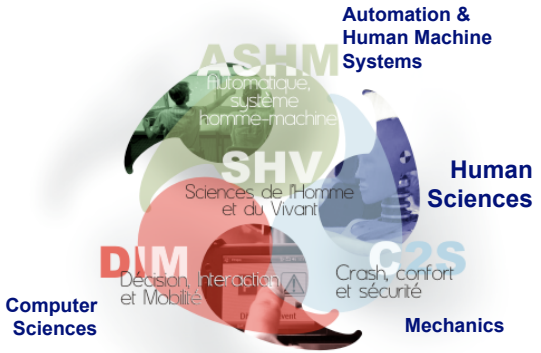
LAMIH : Laboratory of Industrial and Human Automation, Mechanical engineering and Computer Science



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- Several projects in the domain of transportation, especially related to car driving.
  - VOHLAND (2009-2013)
    - To develop a new generation of electric power steering which takes into account the characteristics of drivers with reduced mobility
  - ITERATE project (2009-2011)
    - To develop and validate a unified model of driver behaviour and driver interaction with innovative technologies in emergency situations
  - ABV (2009-2012)
    - To automate (partial or complete withdrawal of the driver) the low speed (up to 50km/h) driving on secured routes (with a degree of quality service)
  - SARI project (2006-2010)
    - To provide drivers with better information about the driving difficulties facing them. Acceptability of the means of information (rumble strips, variable message signs, etc.) was analyzed in this project through fours aspects : social, individual, legal, and economical
  - ARCOS (2001-2004)

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- The ARCOS project
  - French acronym for the Driving Safety Research Program
  - Financed by the PREDIT (French acronym for the Program of Research and Innovation in land Transport)
  - Interdisciplinary project aiming at developing a global approach of the 'Vehicle-Driver-Infrastructure' system in 4 main actions
    - Managing distance between the vehicles
    - Preventing collisions with fixed or slowed obstacle
    - Preventing vehicles from leaving the road
    - Alerting vehicles upstream of incidents/accidents
  - LAMIH :
    - Developing an auto adaptive cruise control (AACC)
      - Analysing the cooperation between the driver and the AACC
        - » Trust

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- The ARCOS project : 3 experimentations carried out using a driving simulator
  - LAMIH Psychology & INRETS MSIS
    - ACC with fixed reference speed (130km/h) and time headway (1.5sec) : *N*=23
  - LAMIH Psychology & LAMIH Automation
    - Conventional adaptive cruise control (ACC) *N*=42
      - Speed from 40 to 170km/h in steps of 5km/h
      - Time headway : 1, 1.5, 2, or 2.5 sec
    - Auto adaptive cruise control (AACC) *N*=30 (15 among them participated at the experiment with the ACC)

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- The Auto Adaptive Cruise Control (AACC)
  - based on conventional ACC
  - with better know-how and know-how-to-cooperate:
    - Cruising speed, time headway, acceleration/ deceleration matched to driver's driving style;
    - If the driver doesn't intervene, AACC adjusted the set speed automatically as required by the road configuration : village; bends in the road; road type (motorway or major roads).

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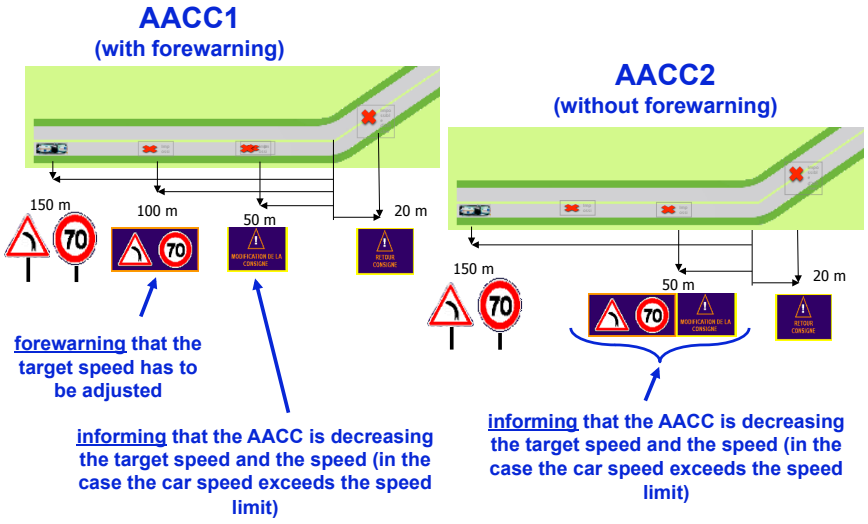

For more information about the AACC, contact Professor Popieul (jean-christophe.popieul@univ-valenciennes.fr) or see Tricot et al. (2006)

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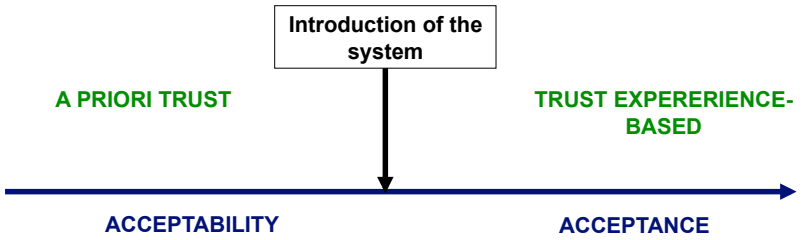

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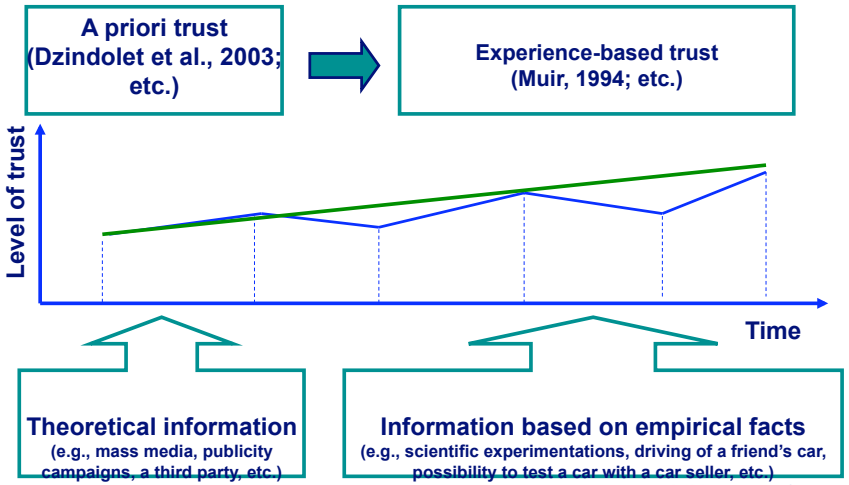
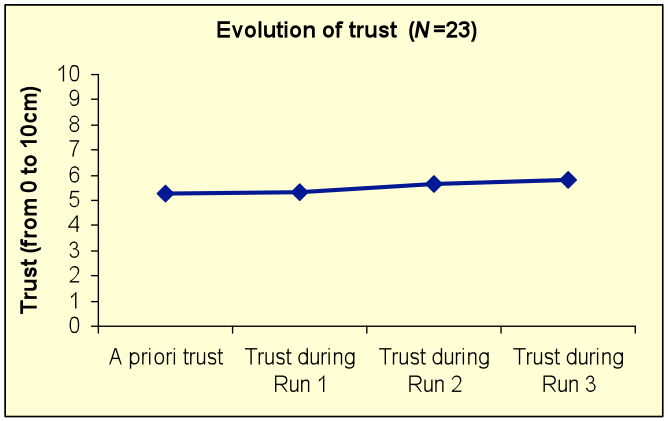


What are the links between trust, acceptability, and acceptance? Intention to buy a car equipped with ACC



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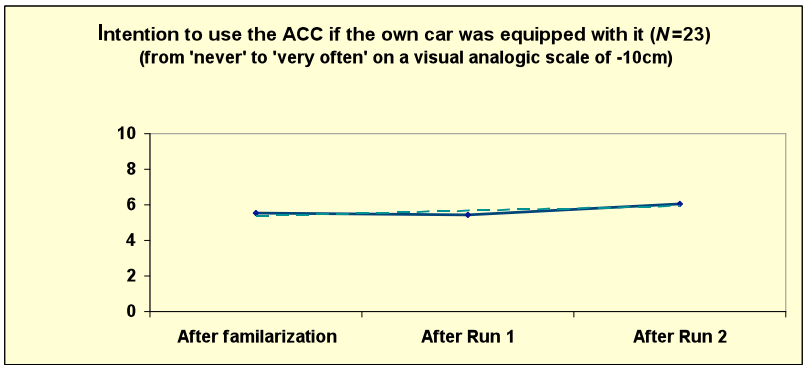

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	AACC mode (between subjects)		ACC kind (within subjects)	
	AACC 1 *N*=15	AACC 2 *N*=15	Adaptive (ACC) *N*=15	Auto adaptive (AACC) *N*=15
Trust in the device (from 0 to 10cm)	**7.03 (2.15)**	**7.36 (1.53)**	**6.80 (2.37)**	**7.41 (1.09)**
Mean use on motor way (%)	**86.54 (15.29)**	**90.39 (5.90)**	**90.06 (10.26)**	**92.99 (5.75)**
Mean use on major roads (%)	**79.47 (17.59)**	**85.15 (5.99)**	**71.55 (20.54)**	**87.71 (6.68)**
Total use (%)	**81.81 (15.40)**	**86.75 (5.37)**	**75.17 (13.31)**	**90.35 (5.17)**

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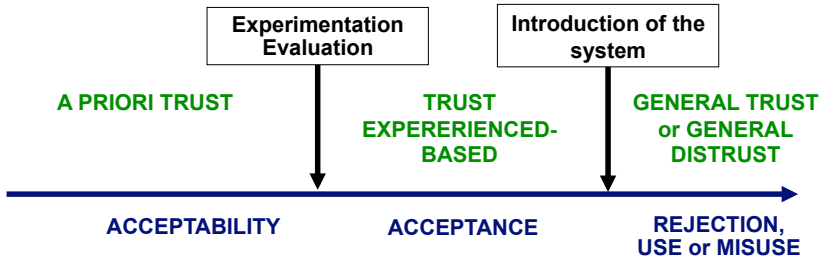

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What are the links between trust, acceptability, and acceptance?
Intention to buy a car equipped with ACC

Individual	eoretical infoer familiarizat		After Run 1	After Run 2
I1	Don't know	Don't know	Don't know	Don't know
I2	With ACC	With ACC	With ACC	Without ACC
I3	Without ACC	Without ACC	With ACC	With ACC
I4	Don't know	Don't know	Don't know	Don't know
I5	Without ACC	Without ACC	Without ACC	Without ACC
I6	Without ACC	Without ACC	Don't know	Don't know
I7	Don't know	Don't know	Don't know	Without ACC
I8	With ACC	Don't know	Without ACC	Don't know
I9	With ACC	With ACC	With ACC	With ACC
I10	Without ACC	Don't know	With ACC	Without ACC
I11	With ACC	Without ACC	Without ACC	Without ACC
I12	Without ACC	Without ACC	Without ACC	Without ACC
I13	Don't know	Don't know	Don't know	Don't know
I14	Without ACC	Without ACC	Without ACC	Without ACC
I15	Without ACC	Without ACC	Without ACC	Without ACC
I16	Don't know	Don't know	Don't know	Don't know
I17	Don't know	Don't know	Don't know	Don't know
I18	Without ACC	Without ACC	Without ACC	Without ACC
I19	With ACC	With ACC	With ACC	With ACC
I20	Without ACC	With ACC	With ACC	With ACC
I21	Without ACC	Without ACC	Without ACC	Don't know
I22	Without ACC	Without ACC	Without ACC	Without ACC
I23	With ACC	With ACC	With ACC	With ACC