

Attractiveness and Use of GPS devices

Study of the customer's perception (sensory & ergonomics) before, during and after use of a Personal Navigation Device

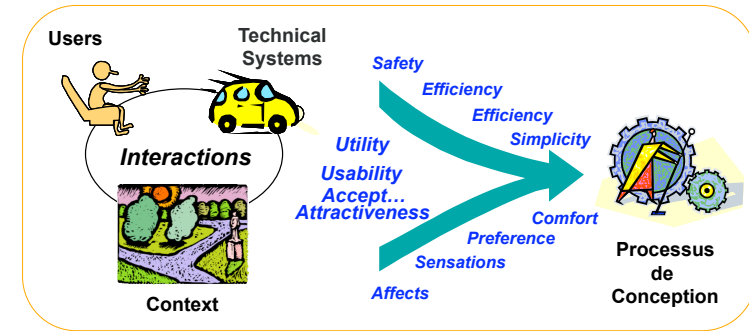
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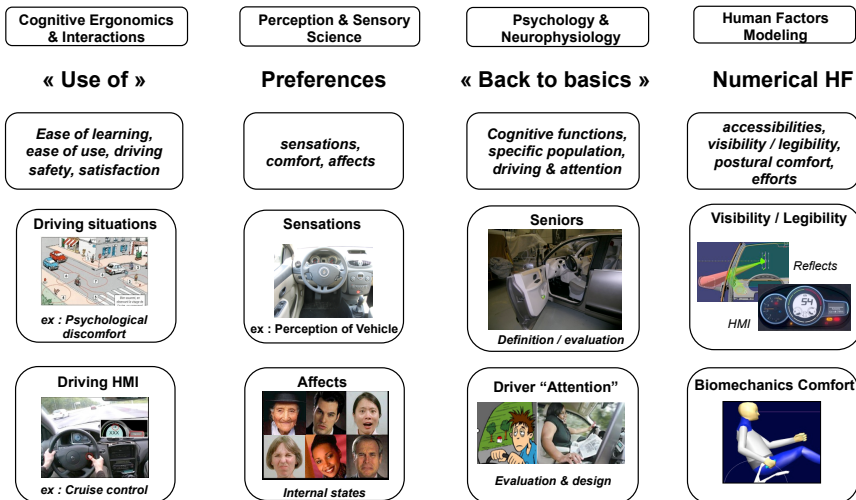


Human Factors Department : Missions

To support the innovation design process by providing detailed knowledge about « in situ » Interactions



Interactions : complementary "points of view"



« Social » internal demand :

Product planning & Marketing demand :

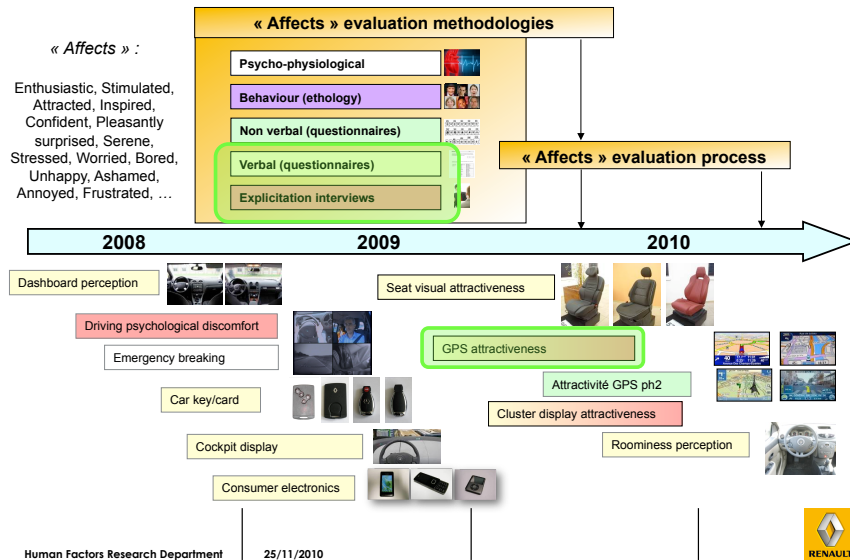
« To strengthen our ability to quantify, to qualify and to anticipate the emotional benefits of our products, including HMI, ADAS, ... »

Beyond an instantaneous « Emotional Quotient », we need :

- To qualify the resulting affects as it is related with brand image when design is concerned
- To provide an insight into the dynamics of emotions / feelings and into the « resulting affect » construction
- To go beyond « show room » effects and to look into the « use-of » impact upon the « emotional benefit »



Affects evaluation methodologies



Context & Objectives

Context

- There are many families of PND graphic design (see next slide)
- "Naïve" hyper-realistic graphics are asked by Marketing people ; do they really increase the ergonomics efficiency or "emotional value" ?

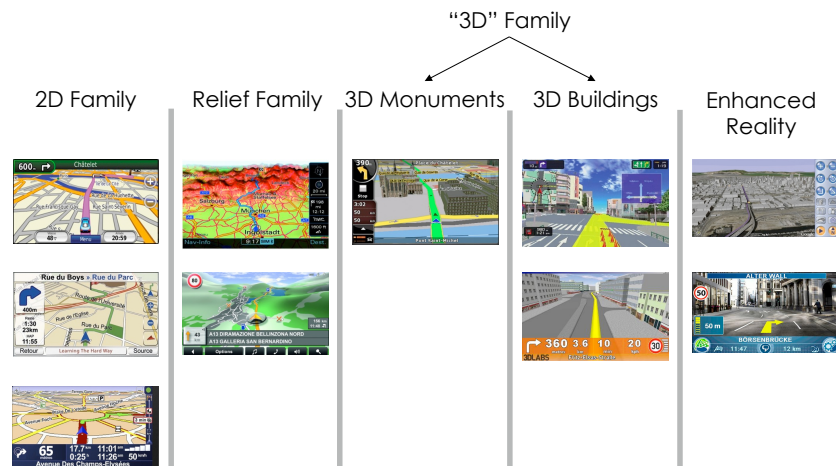
"Design" objectives of the customers' test

- To evaluate attractiveness, guidance efficiency "in action", "up-to-date" (as related to brand image target) of different graphic designs
- To compare the customers' perception before and after the use of the PND
- To make recommendations to the designer

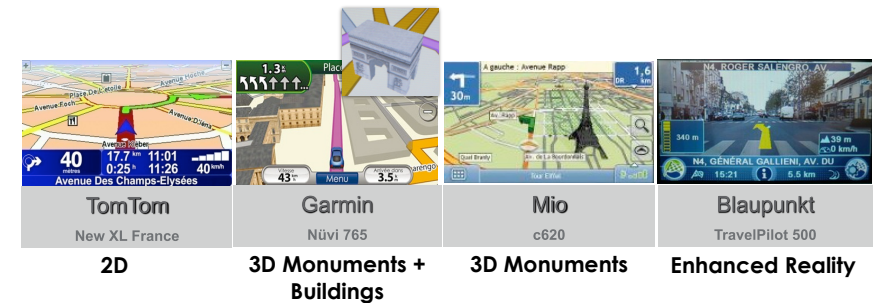
Methodological objectives of the customers' test

- To develop a multidisciplinary approach (Cognitive ergonomics and Sensory Science) as to capture, explain and "predict" attractiveness

There are different kinds of PND

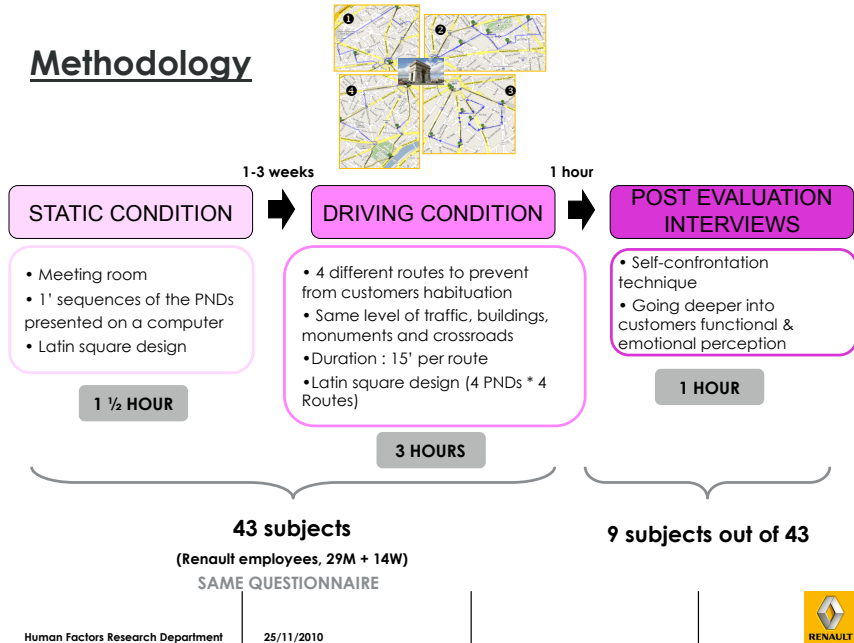


Products' selection



- Each PND family is represented except the "relief" one, irrelevant in Paris
- Focus on the "guidance function" of the PND :
 - The body and the brand are hidden
 - Customers are not allowed to touch the PND : the route is pre-recorded by the experimenter
 - No access to the menu screen : only the guidance screen is displayed
 - Masculine guidance voice

Methodology



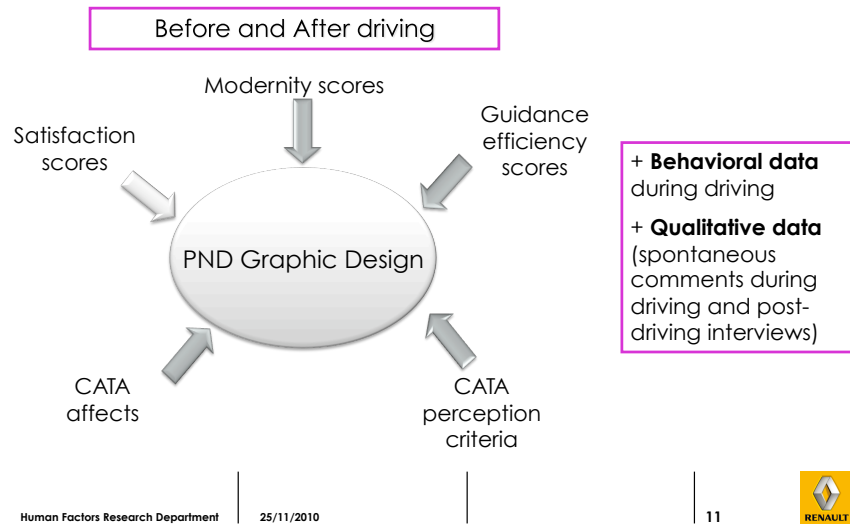
The questionnaire

Pre and Post Driving

- Q1** – Satisfaction scores on 10 (0=I don't like the graphic design ; 10=I really like the graphic design)
 - Q2** – Modernity scores on 10 (0=I don't think this graphic design is modern ; 10=I think this graphic design is modern)
 - Q3** – Guidance efficiency scores on 10 (0=This graphic design is not efficient ; 10=This graphic design is efficient)
 - Q4** – Check All That Applies (CATA) on 36 positive and negative affects (enthusiastic, serene, ...)
 - Q5** – Check All That Applies (CATA) on 36 positive and negative perception criteria (precise, attractive, sober...)
- Spontaneous comments were also recorded during the test.

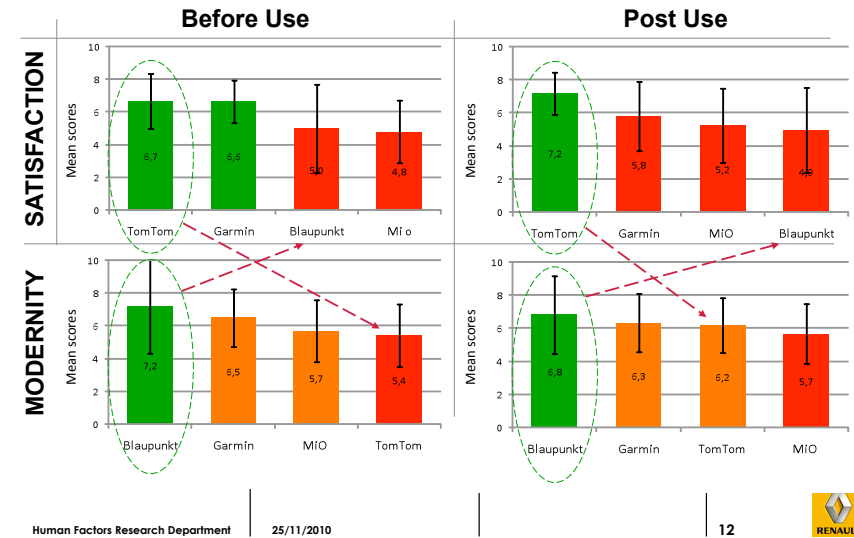
Q4 & Q5 - The lists of CATA affects and perception criteria result from the litterature on PND and from previous studies on technological devices (mobile phones, I-Pod, ...)

To sum up our data

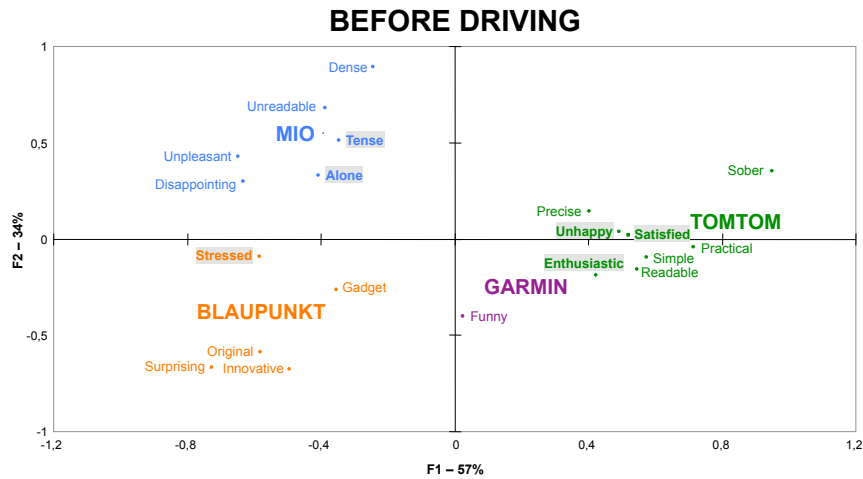


Satisfaction & Modernity scores

Satisfaction scores correlates strongly with efficiency scoring (both before and after use)



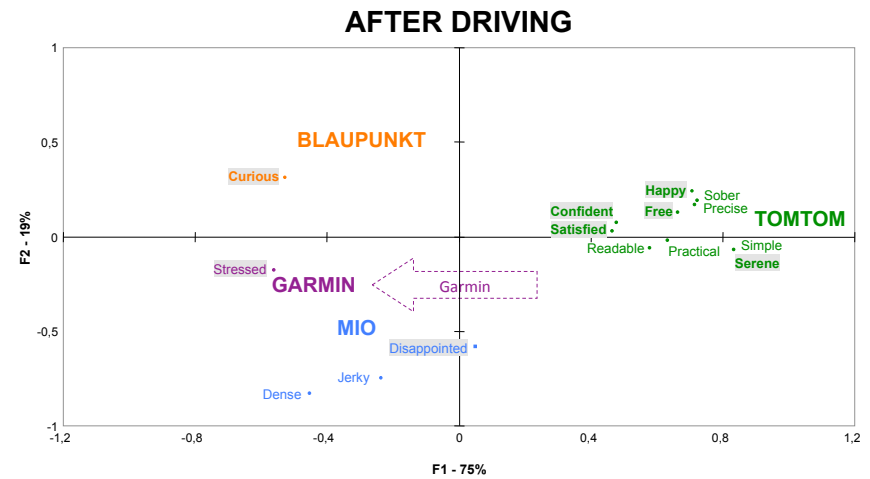
Affects & Perception results



Correspondence Analysis



Affects & Perception results

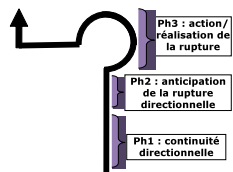


Correspondence Analysis



Cognitive ergonomics analysis

Driving phases



Hesitations and (recovered or not ; conscious vs unconscious) mistakes

		TOTAL
BLAUPUNKT	Hésitations	5
	Erreurs rattrapées ou conscientes	14
	Erreurs inconscientes	1
GARMIN	Hésitations	2
	Erreurs rattrapées ou conscientes	9
	Erreurs inconscientes	0
TOMTOM	Hésitations	3
	Erreurs rattrapées ou conscientes	7
	Erreurs inconscientes	0
MIO680Moov	Hésitations	3
	Erreurs rattrapées ou conscientes	6
	Erreurs inconscientes	1

Impact of the different technical « graphics » items

Flèche
Type de vue
Contenu des infos annexes: eg indications de distance avant intersection, de la vitesse ...
disposition des infos annexes: (bandeau, regroupement...)
couleur / forme / contraste du trajet et des routes
zoom automatique intelligent
affichage du sens de circulation des routes proches
curseur de position
graphismes dont 3D
réactualisation / dynamique
vision globale
Autres sur navigation

Main results :

- Naïve graphics may re-enforce confidence within phase 1 and help the anticipation of the beginning of phase 2 (landmark effects)
- Phase 2 and especially phase 3 require more abstract / pragmatic graphics ; "3D" items should not impede guidance by inappropriate masking
- The azimuth angle of the "view" is a key factor for correct anticipation → the Blaupunkt front camera is highly questionable in that respect



Conclusion

- **Before use attractiveness** is mainly explained by the graphic design of the device, but "**projection in use**" affects it as well
- **Post use attractiveness** is mainly explained by functional aspects of the device, but some graphic design features affects it as well
- Some graphic design properties before the use of the device change into functional properties after the use of the device
- Graphic design properties and functional properties cannot be separated from each others and both contribute to *before use* and *post use* attractiveness of the devices



Discussion

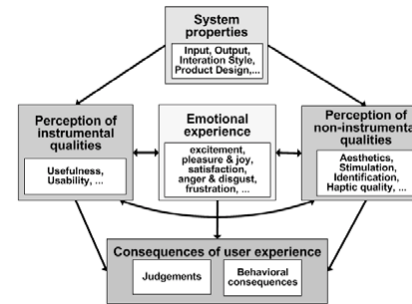
- Functional dimensions do induce positive / negative feelings, even during “show room” phase (expectation model that can be deceived or not). Functional and emotional stuff are not on the same level
- Other dimensions could also induce affects : sensorial dimensions, “private” values, social values, ...
- To « design for emotions » require to take into account a lot different variabilities :
 - Not all the clients are looking at the same feeling, in every context
 - Even though, the technical solutions as to elicit a given affect are certainly not the same (e.g. “joy” for Young vs Older drivers ?)

To go beyond acceptability : too big stuff for « Human Factors » people ?

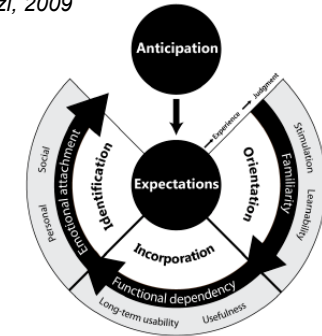


Discussion – some “UX Models”

Mahlke, 2006



Forlizzi, 2009



Link with Acceptability / Acceptance models ?

