For example (1). We apply to computers gender-science stereotypes (a computer with a male voice is judged better than a computer with a female voice).

Males are more competent in mathematics and technology than women (e.g. Nosek, Banaji & Greenwald, 2002)

2) Politness rules: direct requests of evaluation (evaluate a given software on a computer) gives more positive and homogeneous responses as compared to indirect requests of evaluation (paper-and-pencil evaluation of the same software in another room)

"It says, '22,873 tons of bituminous coal, and I think I love you.'"

(3) Stereotypical inferences: people (and computers) who compliments a lot are judged as less intelligent as compared to people (and computers) who made several criticisms.

I HATE YOU
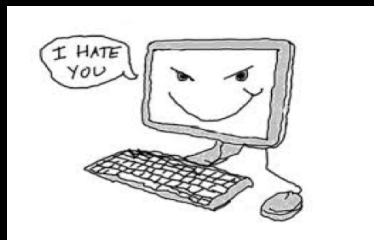
Unconscious aspects: aesthetics

Empirical evidence (starting from Kashimura & Kurosu, 1995) show that products perceived as located at an high hedonic level (i.e. perceived as "beautiful") are also more easy to use (i.e. usability metrics show less errors and faster task's completion rate).

'What is beautiful is usable'.

Unconscious aspects: aesthetics, subjective preference and usability

But also:

'If I like it is usable'

My web-site is readable (because is beautiful)

- **What is the best colour combination for a web-page?**

- Our hypothesis was that some web masters do prefer colour combinations which they know are not the most effective, but that they do consider "more beautiful" or better representing their personalities, and for this reason they consider them as "readable".

<div align="right">Actis-Grosso, Landoni, Rabolini (2007)</div>

My web-site is ALWAYS readable

- To perform a research aimed to test this hypothesis we first analyzed 152 on-line web sites, selecting the most frequently used colours for both background and text.
- We then run two experiments

<div align="right">Actis Grosso, Landoni, Rabolini (2007)</div>

## My web-site is readable (because is beautiful)

- **Participants**: 12 webmasters with their own web site. They were told that the goal of the experiment was to evaluate the legibility of different coloured texts/backgrounds for a new site, but they were not told that one of the link for coloured texts/backgrounds was corresponding to their own personal web site text/background colour.

Actis-Grosso, Landoni, Rabolini (2007)

My web-site is readable (because is beautiful)

The main result is that pleasantness and legibility do not differ only when subjects are evaluating their own site (p<0.013 vs. p = 0.076).
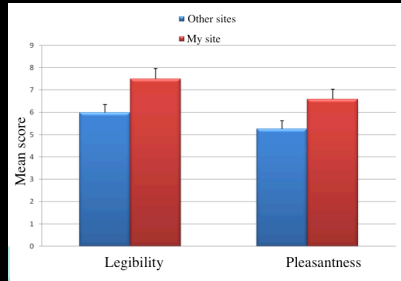
- The mean score given by webmasters to the colour combination of their own web site differ from the mean scores for other links (both for legibility and for pleasantness), even when they were not aware of being evaluating their own choice (4 subjects out of 12 did not realize that one link was corresponding to their own personal web site).

Actis-Grosso, Landoni, Rabolini (2007)

My web-site is ALWAYS readable

Results of this experiment put in light that not only aesthetical preference has an effect on actual performance, but that people tend to consider more usable (even more readable) what they like, indipendently on objective measure (e.g. yellow text on white background).

Actis Grosso, Landoni, Rabolini (2007)

Unconscious aspects: aesthetics

On the basis of these studies the concept of apparent usability emerged (e.g.Tractinsky, 2000): people decide whether a product is usable or not on the basis of

(a) rationale principles (more obvious)

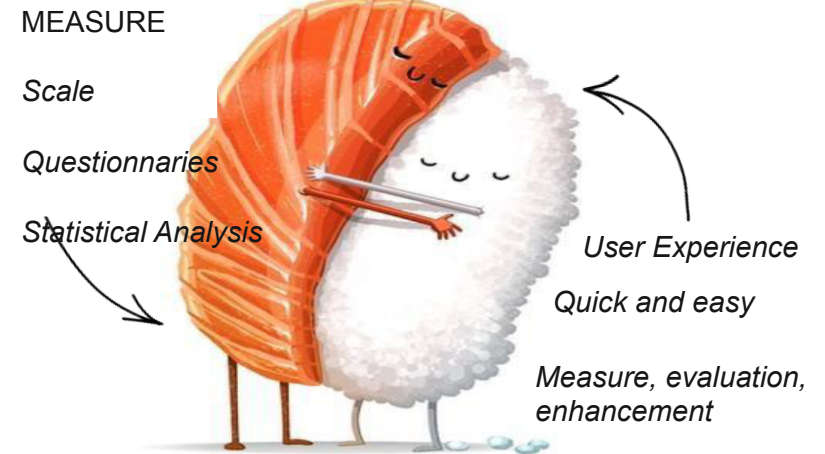(b) irrationale principles (the effect of the so called "look and feel")

It is possible to measure User Experience?

In Psychology (not only experimental, but also social, clinical...) we know that each aspect of an experience needs careful observation, and possibly to run controlled experiments.

It is possible to measure User Experience?

However, industries need quick answers in order to develop products that could be competitive in the private market.

MEASURE

Scale

Questionnaries

Statistical Analysis

User Experience

Quick and easy

Measure, evaluation, enhancement

Measuring UX: a challenge for HCI

To establish and to know the metrics for UX means:

- To understand HOW user perceives the product or the system;

- To better understand design strategies;

- To forecast the degree of satisfaction of the user

- To increase sales and improve brand perception.

Measuring UX: three points still to be defined

1) What to measure;

2) How to measure;

3) Who to involve in the measuring process

Usability: Measures and unity (of measure)

Usability objective	Effectiveness measures	Efficiency measures	Satisfaction measures
Overall Usability	Percentage of tasks successfully completed. Percentage of users successfully completing tasks	Time to complete a task. Time spent on non-productive actions.	Rating scale for satisfaction. Frequency of use if this is voluntary (after system is implemented)

Iso 9241-11:1998

Usability objective	Effectiveness measures	Efficiency measures	Satisfaction measures
Meets needs of trained or experienced users	Percentage of advanced tasks completed. Percentage of relevant functions used.	Time taken to complete tasks relative to minimum realistic time.	Rating scale for satisfaction with advanced features
Meets needs for walk-up and use	Percentage of tasks completed successfully at a first attempt.	Time taken on first attempt to complete task. Time spent on help functions	Rate of voluntary use (after system is implemented.

Usability objective	Effectiveness measures	Efficiency measures	Satisfaction measures
Meets needs for infrequent or intermit-tent use	Percentage of tasks completed successfully after a specific period of non-use.	Time spent re-learning functions. Number of persistent errors	Frequency of reuse (after system is implemented)
Learnability	Number of functions learned. Percentage of users who manage to learn to a pre-specified criterion.	Time spent on help functions Time to learn to criterion	Rating scale for ease of learning.

Good ways to have good metrics: usability methods

- Observation, interviews and questionnaires
- Personas e scenarios
- Thinking aloud, probes, card sorting
- Task analysis
- Heuristic evaluation
- Cognitive walkthrough
- Participants based evaluation

What about UX?

- *Ad hoc* tools specifically designed for different products and scenarios, without any test for their effectiveness and validity (both internal and external).

WHAT IS TO BE MEASURED?

ATTRACTIVENESS

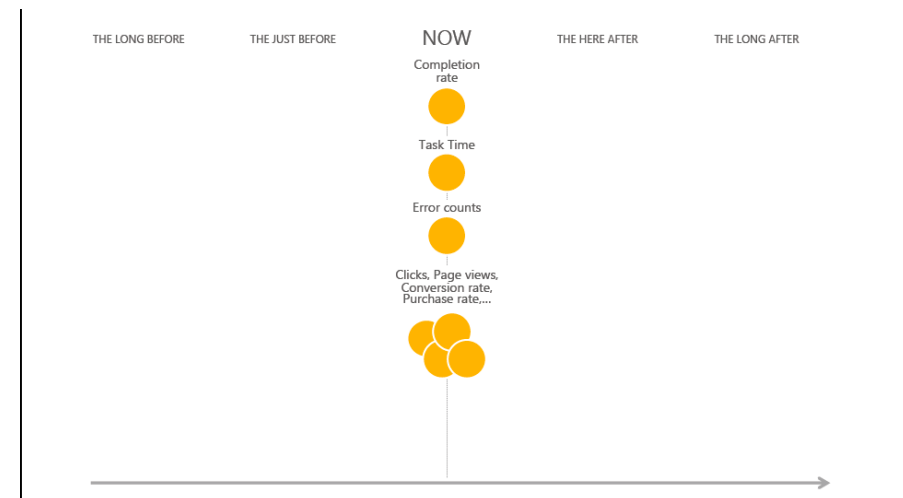Impressions towards the product, along a dimension of acceptance/rejection
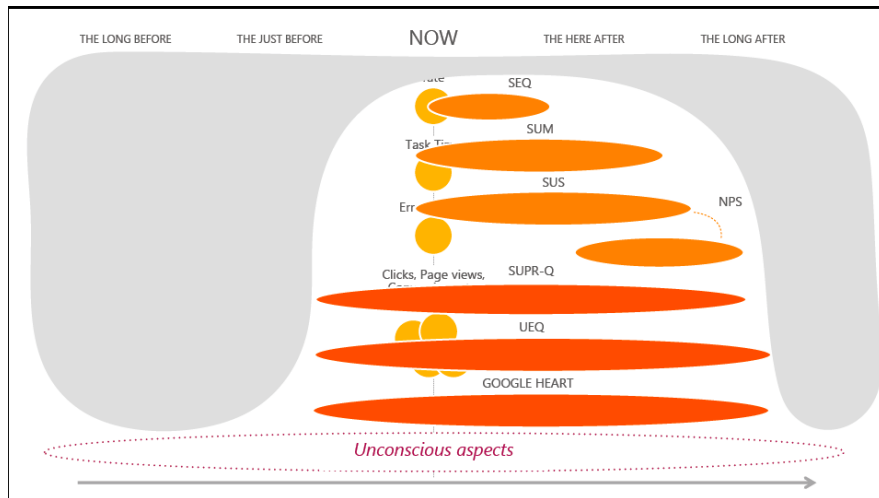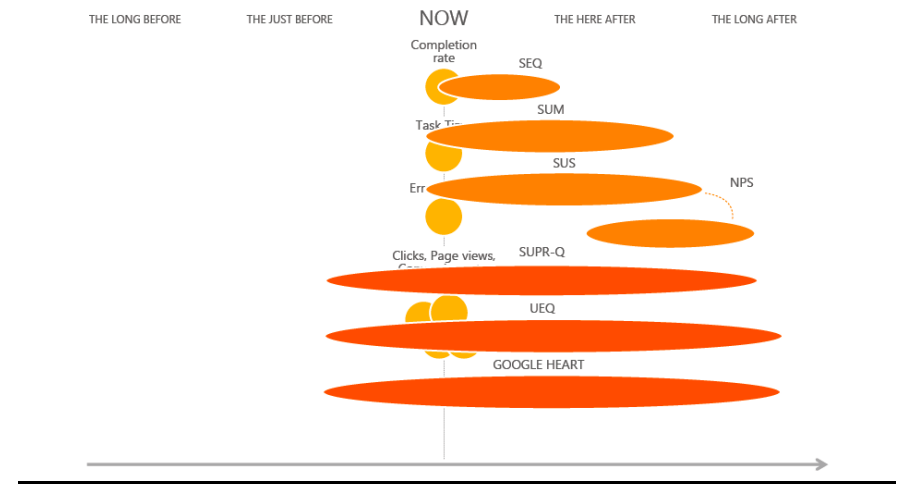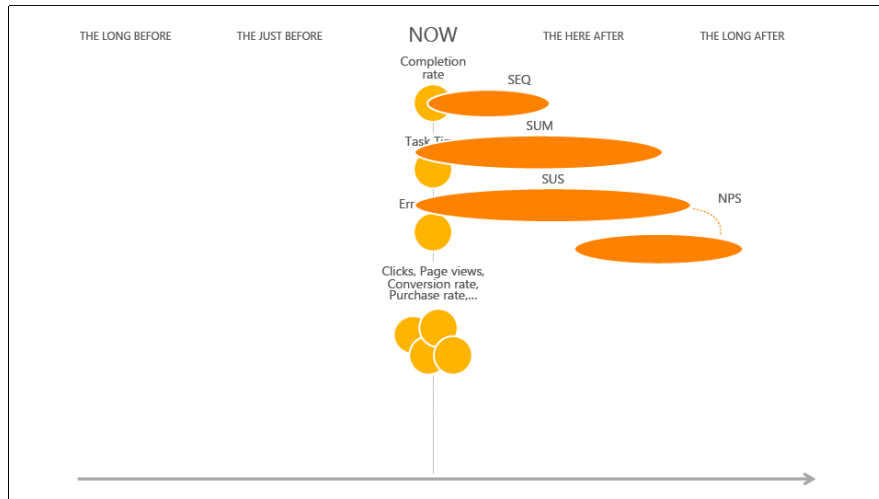
PRAGMATIC QUALITY	HEDONIC QUALITY
Task oriented qualitative aspects, as efficiency, learnability etc	Non-task oriented qualitative aspects, as stimulation, aesthetic valence

WHAT (and how) has been measured until now?

THE LONG BEFORE   THE JUST BEFORE   NOW   THE HERE AFTER   THE LONG AFTER

Completion rate

Task Time

Error counts

Clicks, Page views, Conversion rate, Purchase rate,...

What about "unconscious (implicit) aspects" (e.g. attitudes, prejudiges, dispositions, stereotype…)?

An attitude is a mental and neural state of readiness, organized through experience, exerting a directing or dynamic influence upon the individual's response to all objects and situations which it is related" (Gordon Allport, 1935).

Measuring behaviour detect short-term action, measuring attitudes generate effects that persist in the long run.

Unconscious aspects: CASA THEORY

According to CASA paradigm, if humans and machines share the same – or similar - pattern of communication behaviour, then humans would apply to machines the same social cognitive constructs and stereotypes that they apply to other humans.

In 2014 a private company asked me to understand why their top-level washing machines do not meet their selling expectations

Could CASA paradigm be applied also to machines other than computer and new media?
- Hypothesis: the more complex is the responding behaviour of a technological device, the more elaborated will be the social constructs developed towards it
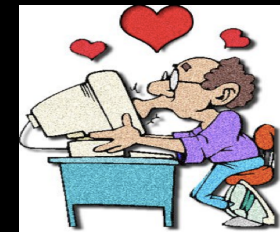
When a machine allows to its user only few operations humans would develop with such a machine a very basic social interaction, applying only implicit attitude or stereotype which are deep-rooted in every social interaction.

Unfortunately (at least for women), between the deep-rooted implicit attitudes and stereotypes, gender stereotypes are probably the more robust.
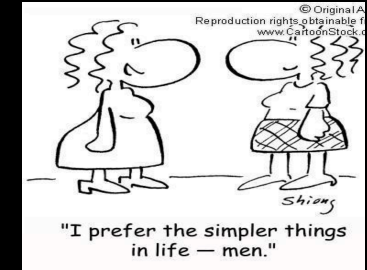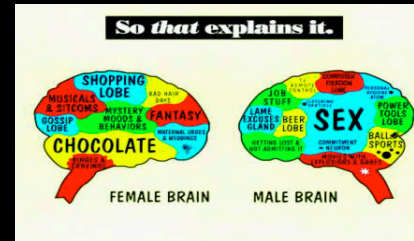
- Working Hypothesis: humans apply gender stereotypes even to very simple machines, such as standard household electrical appliances, and their interaction with such appliances is influenced by these stereotypes.

If humans apply gender stereotypes to basic machines, then machines that are more technological (such as computers or smart-phones) would be associated to male, whereas less technological machines (such as mixers or cookers) would be associated to female.