It’s the Man, Not the Machine

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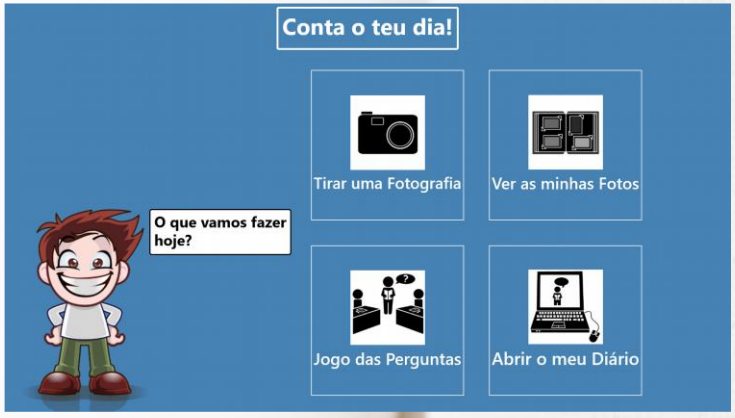
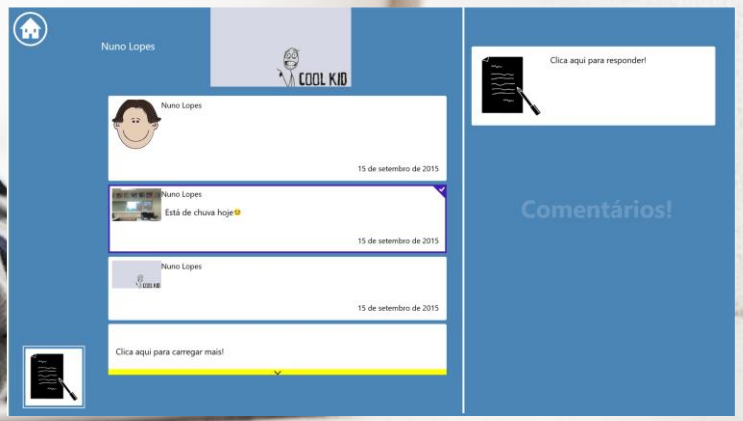
Class 02


Technology can play an important role in our daily lives
If we manage to harness its power to serve our needs and motivations


Designing and developing
for different audiences
is challenging
We must understand
users and their needs

"Tell Your Day"





https://danskebank.com

Supporting ASD children, at home

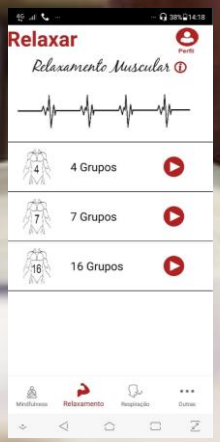
Application “Medication Assistant”

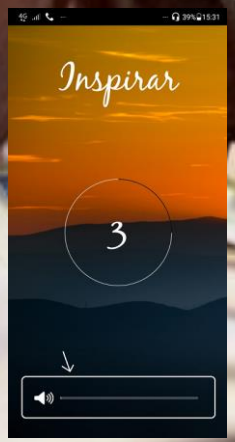
S4S
smartphones for seniors

Beyond just a medication reminder

ieeta

Stop Anxiety





Human-Centered Effort to Support Anxiety Management in the Academic Context

Human-Centred Technologies

User Profiles

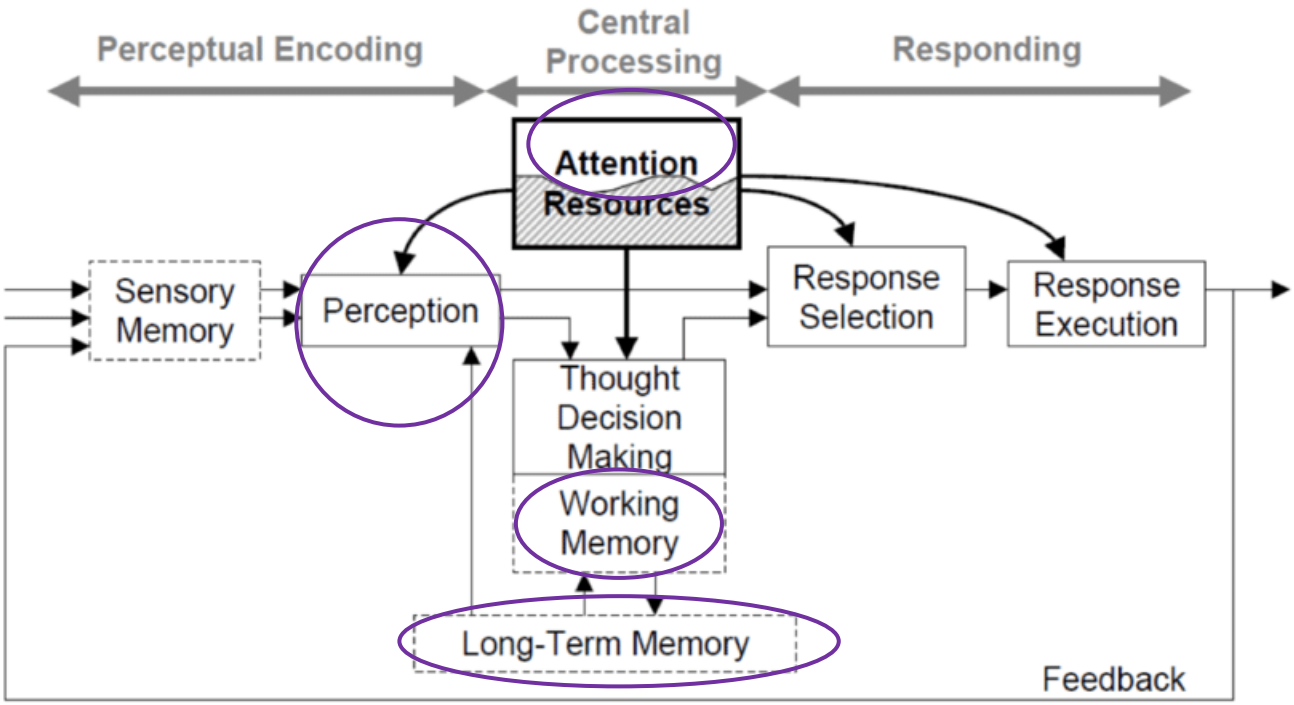
- Human Information Processing System (HIPS)

- Knowledge and experience
- Work and task
- Physical characteristics
- Environment
- Tools

Human Information Processing System

- Humans have different capabilities that might be considered when designing interactive systems
- Information is received through various I/O channels
- Information is stored in memory
- Users share common characteristics but differences that cannot be ignored

Human Information Processing System
overall view

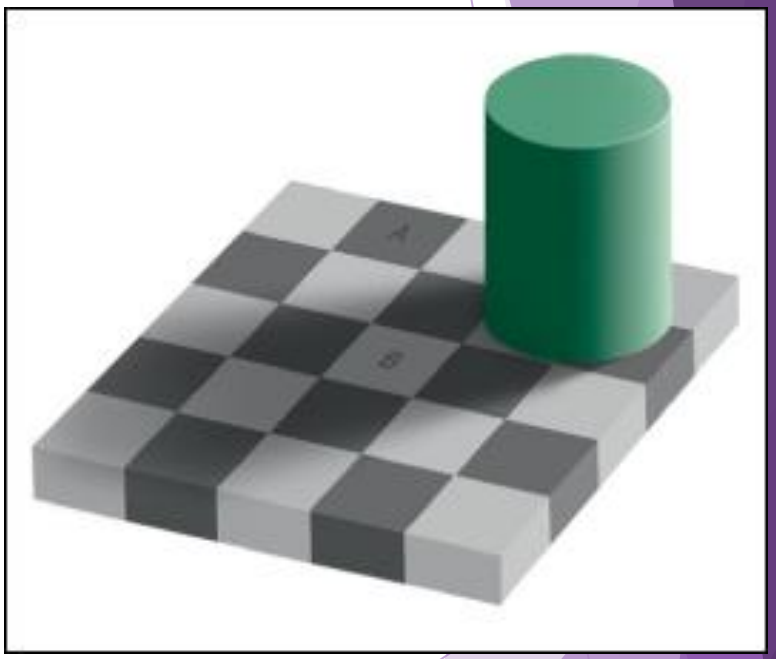


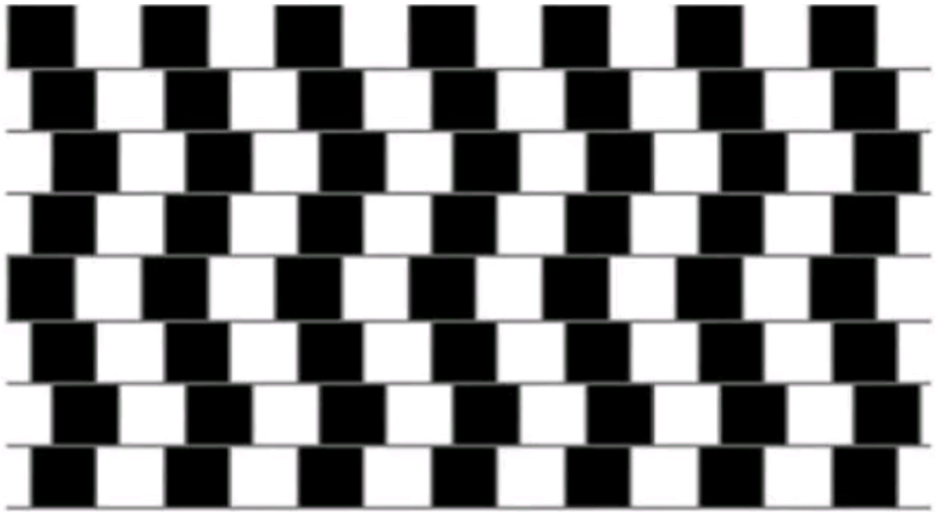
Vision

- Most important sense for humans
- It is our sense with the largest capacity to collect data from what surrounds us
- Strong capacity to compensate for ambiguities

Maintaining the sense of colour in challenging illumination

- Despite the lighting differences over the board we can still distinguish which one is a lighter grey. A or B?

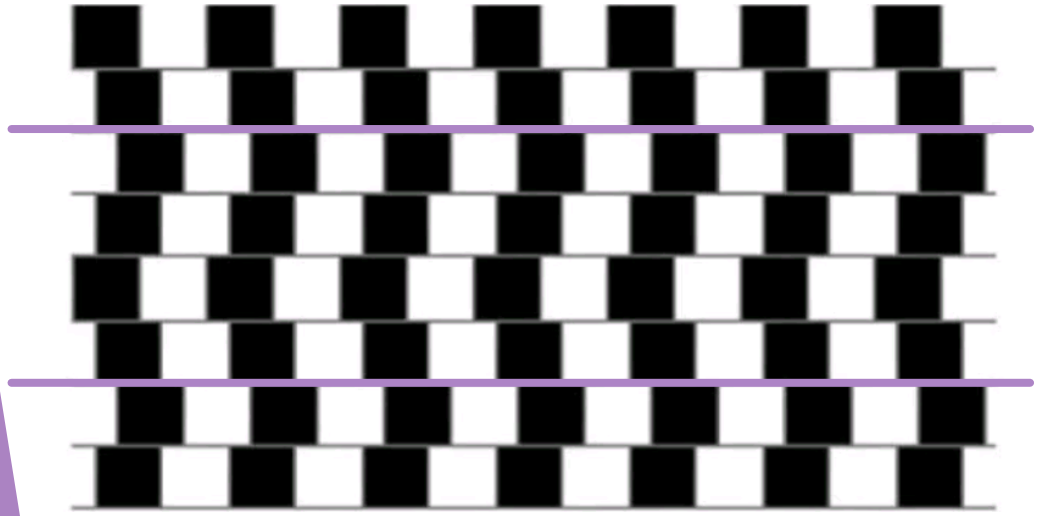


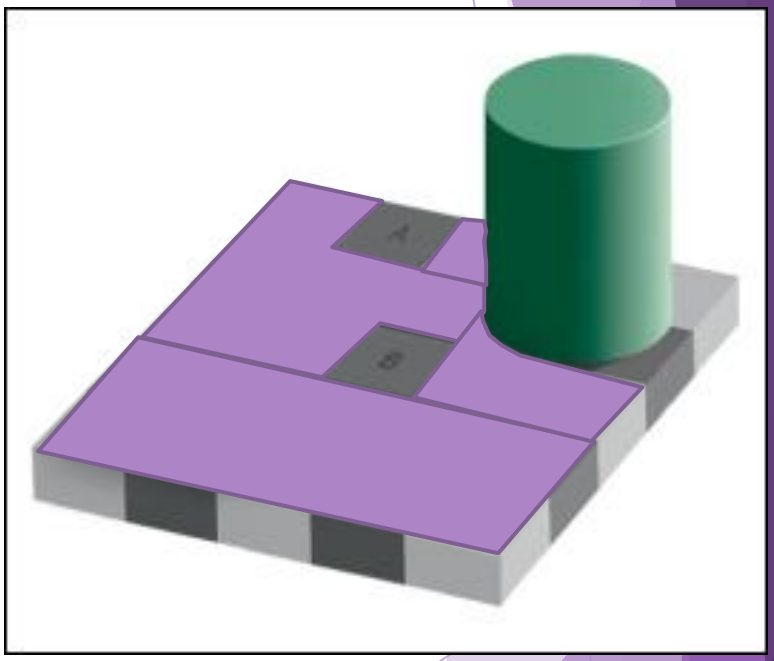


- How many lines are parallel?

Colour Constancy

- They are actually the same colour
- How many lines are parallel?



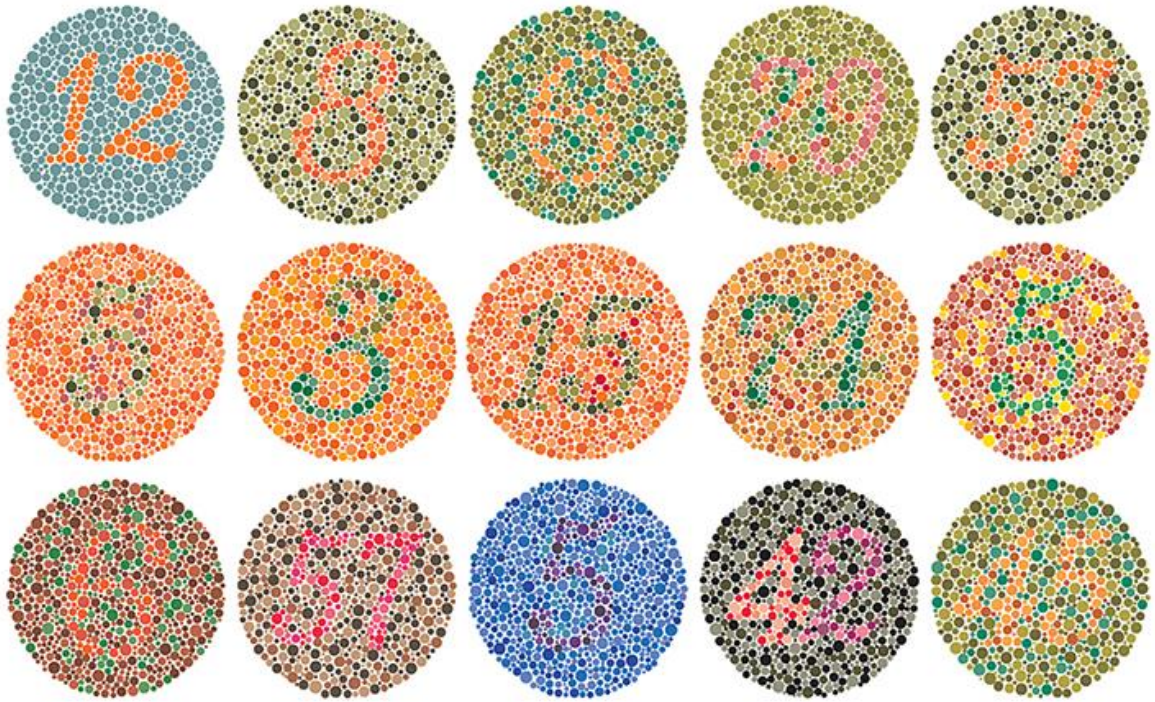



Does not seem a good idea for camouflage…


Now imagine you want to
choose a zebra to attack while
looking from behind the bush

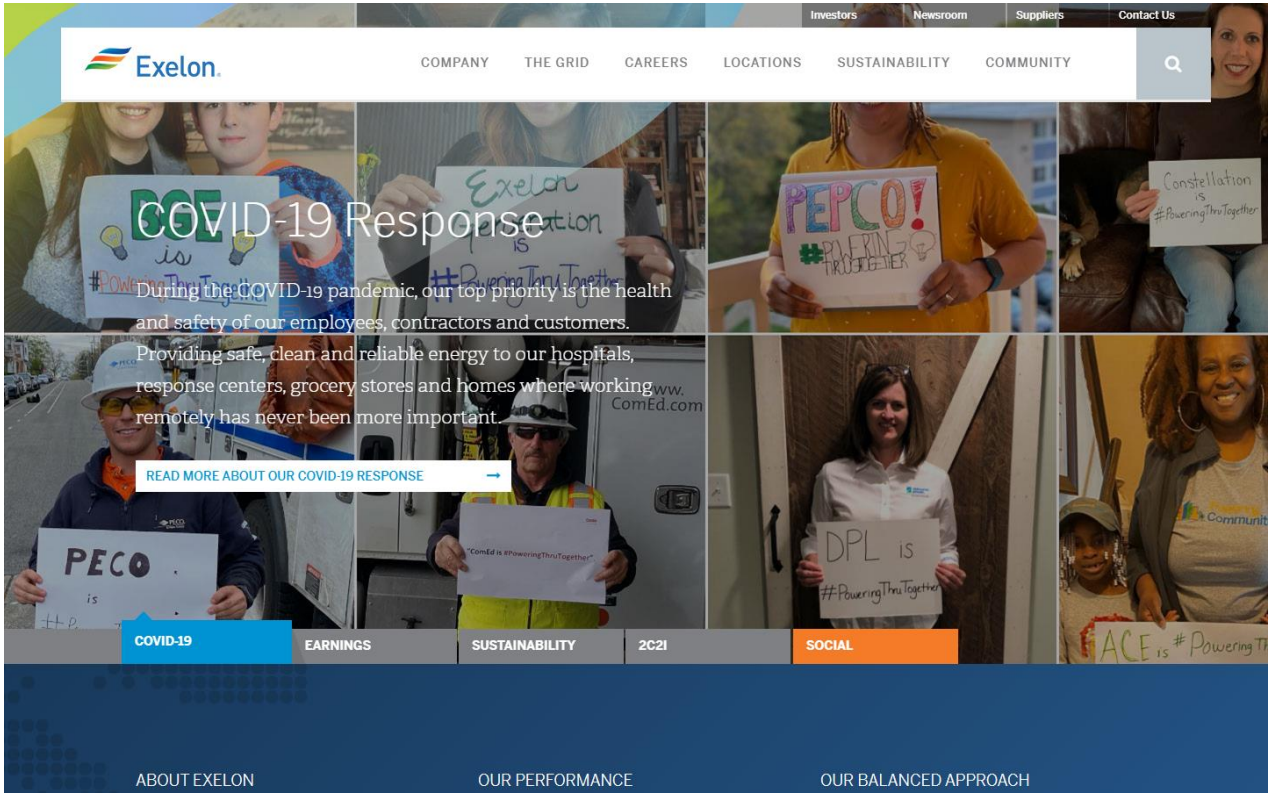
Colour Perception Issues

Inability to distinguish certain shades of colour



American Optometric Association

Messing up!


Investors
Newsroom
Suppliers
Contact Us
Exelon.
COMPANY
THE GRID
CAREERS
LOCATIONS
SUSTAINABILITY
COMMUNITY
COVID-19 Response
During the COVID-19 pandemic, our top priority is the health and safety of our employees, contractors and customers. Providing safe, clean and reliable energy to our hospitals, response centers, grocery stores and homes where working remotely has never been more important.
READ MORE ABOUT OUR COVID-19 RESPONSE
PECO
DPL is
#PoweringThruTogether
Constellation is #PoweringThruTogether
COVID-19
EARNINGS
SUSTAINABILITY
2C2I
SOCIAL
ABOUT EXELON
OUR PERFORMANCE
OUR BALANCED APPROACH

Design Implications

Vision

Element position, shape, and color can influence visual grouping

Color needs to be used with care and never as the only property to provide information

Any moving/flashing elements on the interface capture attention and should be used sparingly

Touch

- Important feedback
- Key sense for people with sight problem
- Several receptors in skin:
  - Termoreceptors: cold and hot
  - Nociceptor: pain
  - Mecanoreceptor: pressure
- Some areas more sensitive (fingers)

Hearing

- Information on direction, objects and distance
- Only sense that is really 3D
- Cannot be “turned off”
- Human hearing - 20Hz to 15KHz
- Filtering is possible (Background noise – “cocktail party” example)

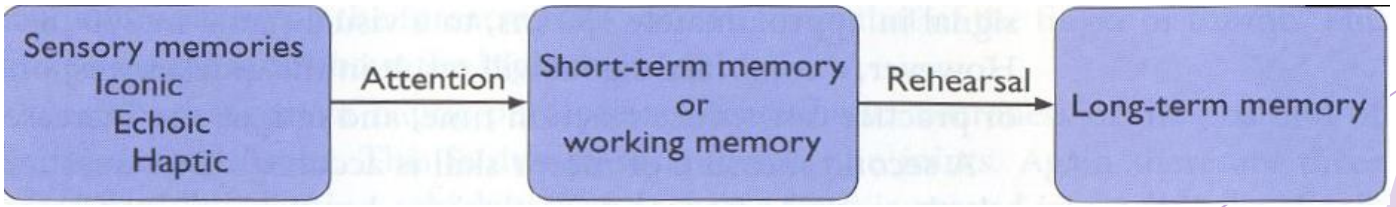
Smell and Taste

- Complex chemical senses
- High latency
- Difficult to use in HCI
- Some experimental work exists

Memory

The **Atkinson–Shiffrin model** (1968) (a.k.a. multi-store model or modal model) asserts that human memory has three components:

- Sensory memory
  - A few seconds
- Short-term memory / working memory
  - +/- 18 seconds, 7+/-2 items
- Long-term memory
  - ~Infinite capacity



Short Term Memory (STM)

Working Memory

- Short duration: a few seconds (<30s)
- Limited capacity: 7+2 items
- what is an item?

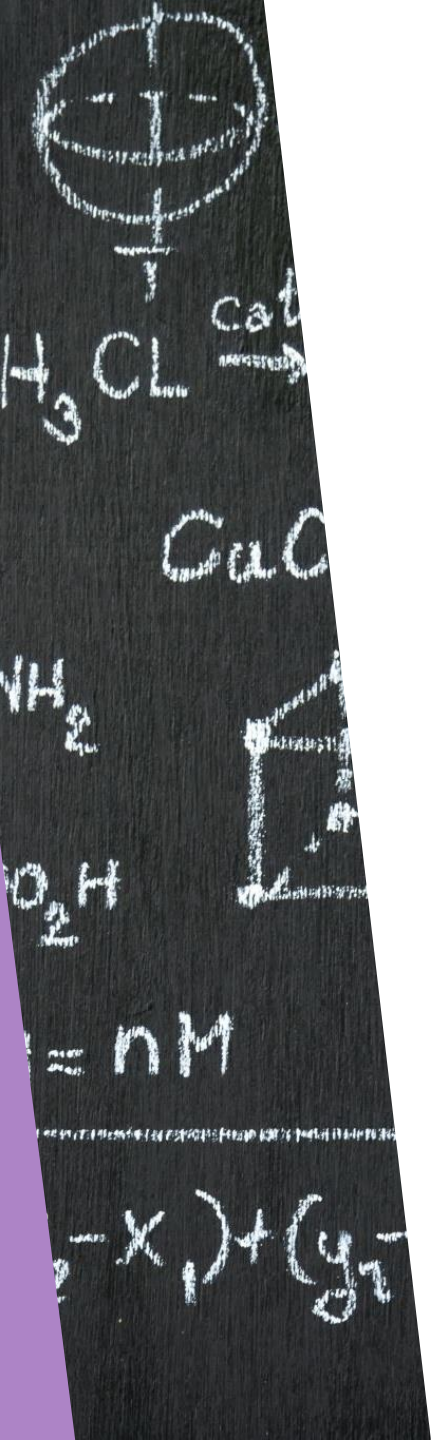
example: try to memorize the following numbers

649325401741

111122223333

which is easier?

and this one: **351234370517**



Short Term Memory (STM)

649325401741 ---> 12 digits

111122223333 ---> 3 digits and a rule

351 234 370 517 ---> PT AVR UNIV IEETA 17

These numbers correspond to different “chunks”

Chunk: the largest meaningful unit that a person recognizes; depends on the person knowledge

Design Implications

Memory

Reduce cognitive load avoiding long and complicated procedures

Design for **recognition** rather than recall

Provide users with multiple ways of labeling digital information

Selective Attention

Occurs when we block out certain features of our environment and focus on one particular feature

It may be:

- Voluntary
- Involuntary

Both can be (and are) exploited in UIs

Visual Salience

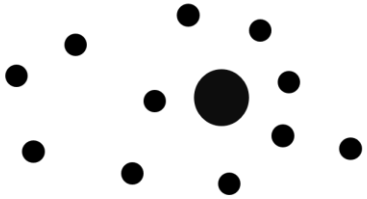
Sometimes, elements in images or interfaces catch our attention first

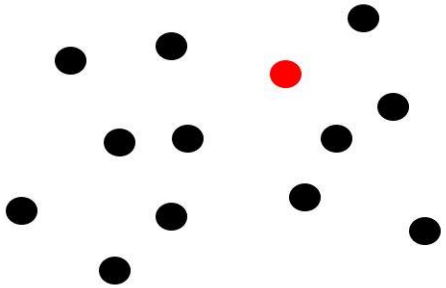
This can be do to color or contrast properties

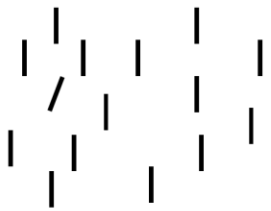
It can concern shape

It can be due to movement…

Selective Attention







Your gaze is “attracted” to the different element

Design Implications

Attention

Consider context. Make information salient when it requires attention at a given stage of a task.

Avoid cluttering visual interfaces with too much information.

Consider designing different ways of supporting effective switching and returning to a particular interface.

User Profiles

- Human Information Processing System (HIPS)

And what about these? How do we define them?

- Knowledge and experience
- Work and task
- Physical characteristics
- Environment
- Tools

User Profiles

- **Knowledge and Experience**
  - Education and reading level. experience with the system and task, mother language, computer literacy …
- **Work and task**
  - usage frequency, training, usage type (mandatory, optional), usage of other systems …
- **Physical Characteristics**
  - color vision deficiencies, physical deficiencies, handedness, age …
- **Cultural aspects!!…**

Remember

Several **perceptual** and **cognitive** aspects are common, among users, and need to be accounted for, **always**…

Users are **very different from designers** and developers

Users vary a lot among themselves

Users **change along time** (evolve, forget)

Human Centered Design

Involve users in the design and development from the very first instant

1. Understanding and specifying the context of use
2. Specifying the user requirements to drive the design
3. Producing design solutions meeting requirements
4. Conducting user-centered evaluations


In the beginning...
The Crowd
... this is what we know about our users

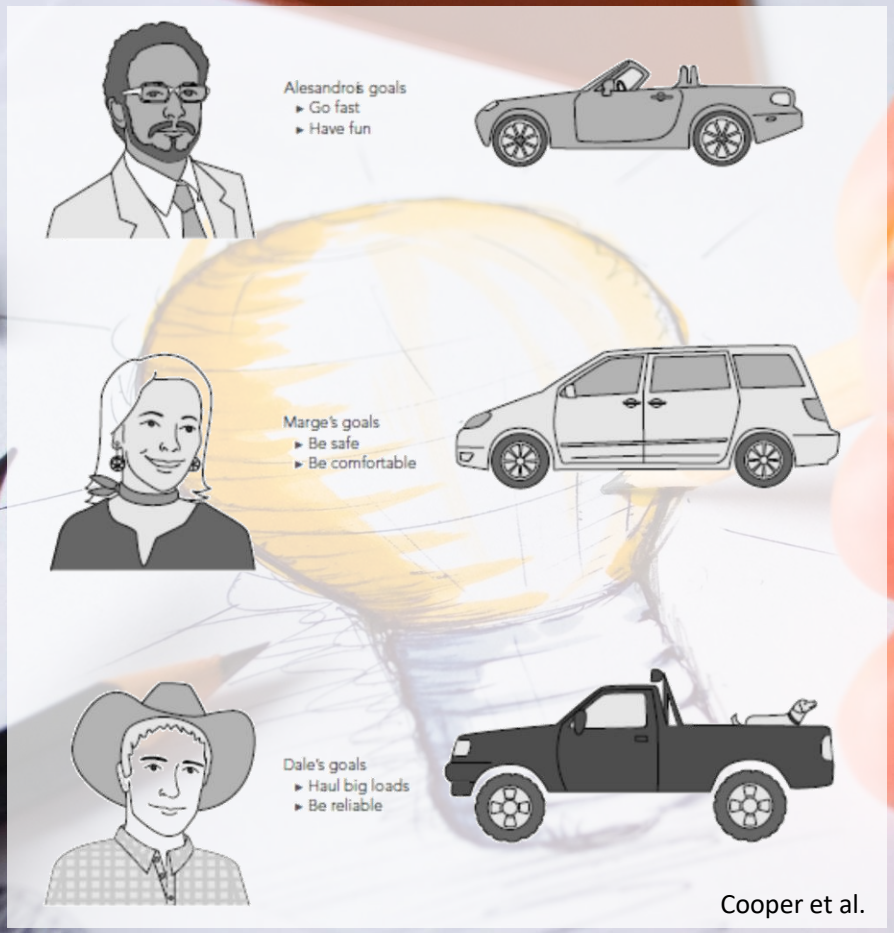
Designing to please every possible user…

Cooper et al.

… often results in low user satisfaction, overall

You need to define the users for your project!

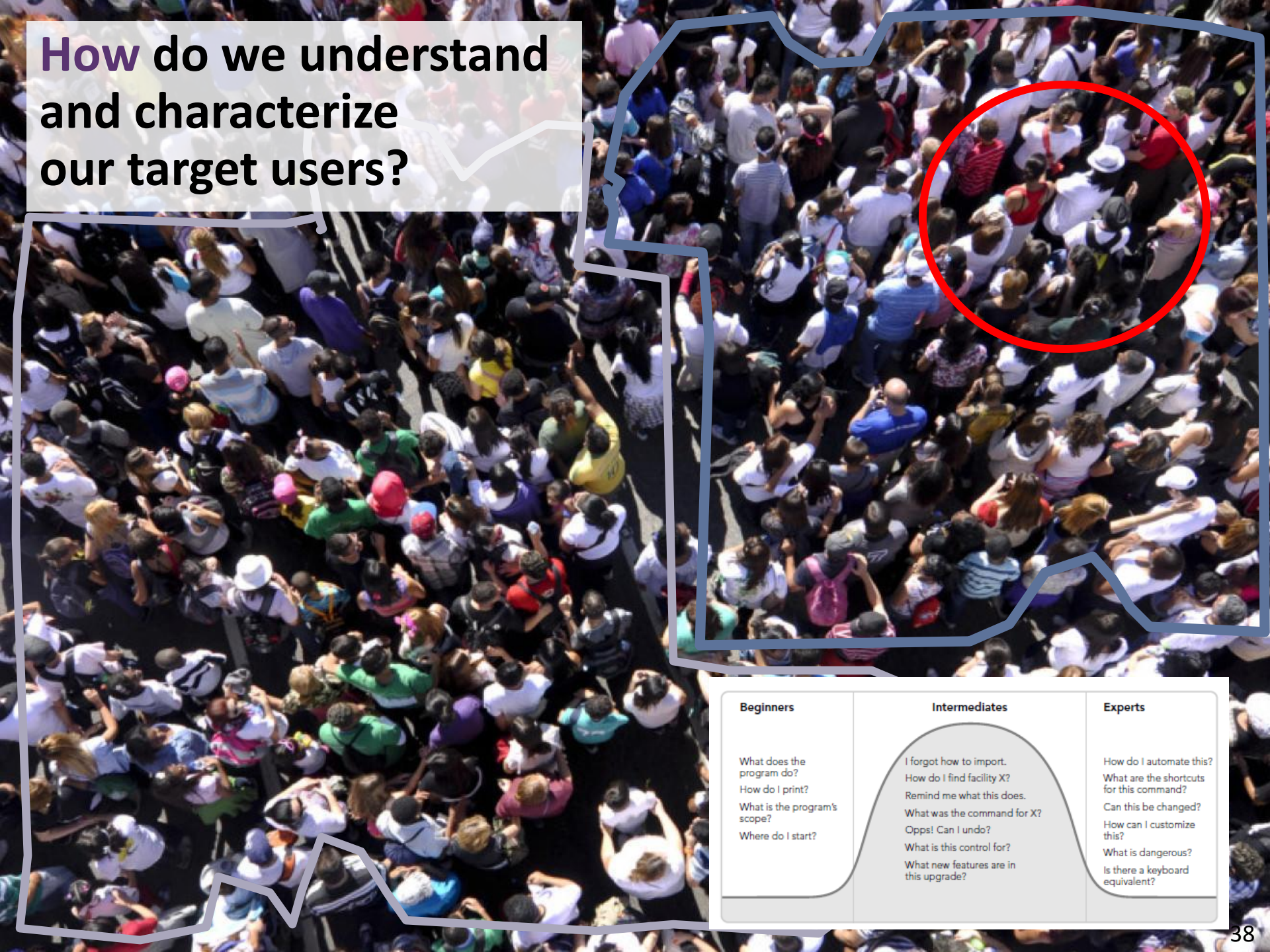
We need to understand which types of users matter…



Cooper et al.

… and target their specific goals

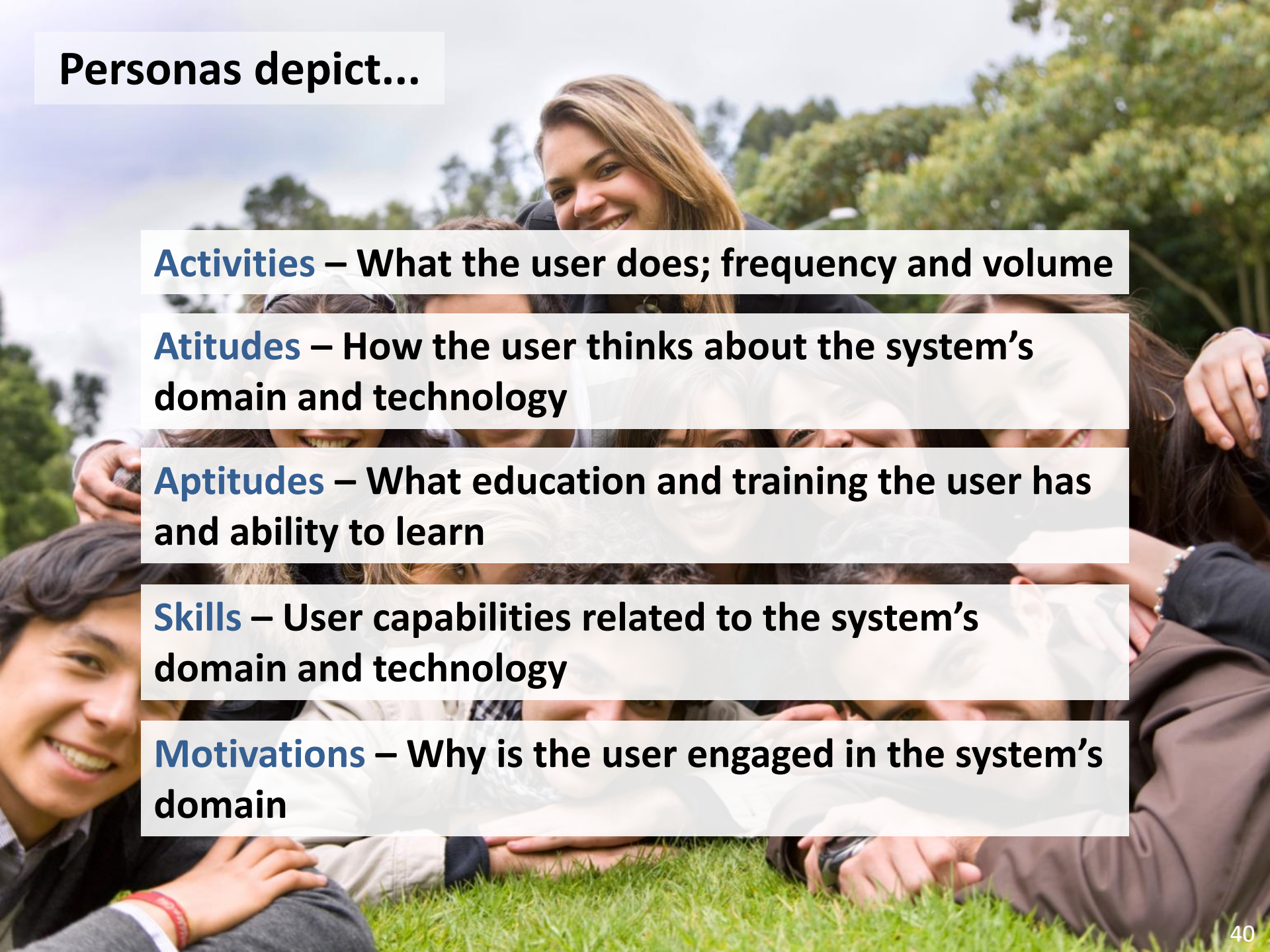
How do we understand and characterize our target users?



Personas

- Based on research
- Represented as individual people
- But, represent groups of users
- Explore ranges of behaviour
- **Must** have **motivations**

Personas depict...



Activities – What the user does; frequency and volume

Atitudes – How the user thinks about the system's domain and technology

Aptitudes – What education and training the user has and ability to learn

Skills – User capabilities related to the system's domain and technology

Motivations – Why is the user engaged in the system's domain

Personas articulate this information and...

- **Include biographical data**
- **Are presented in narrative form**
- **Have a photo**

How do I get to know all that?

- Relevant literature
- Focus groups and interviews
- Learn by proxy

Personas as tools to understand and empathize with users

Persona for Nuno Rocha, a kid diagnosed with ASD.

Nuno Rocha, born on February 20th, 2005, in Aveiro, Portugal, lives with his parents and a 13 year old sister. At the age of two he went to a Child Development appointment, at the district hospital, because his parents suspected that something was wrong, after which he was sent to an autism exam at the Paediatric Hospital of Coimbra. At the age of three, he was diagnosed with an Autism Spectrum Disorder (level 2 in the scale of severity), with associated cognitive deficits.

General characterization of the child

He is attending the 4th grade at Anadia's Primary School, benefiting from a Structured Teaching Unit (STU) delivering him a structured learning model (TEACCH) and the application of interdisciplinary intervention methodologies. He also benefits from Speech Therapy sessions.

Nuno follows an individual curriculum (consisting of changes to the normal curriculum, by introducing, replacing or eliminating goals and contents). On a daily basis, for 2 hours, he attends the regular class to work sociability, whereas functional classes (like functional Portuguese, world knowledge, functional math and every day activities) are learned at the STU.

School and curricula

At home, he prefers to watch TV and play computer games. When asked about professional preferences, he mentions he would like to stay at home with his mother and watch TV or play computer games.

He appears to dominate the basic functions of a computer; however, he only uses his ability to play computer games. He is not able to research information on any search engine, nor does he use social networks for communication.

Technology adherence and proficiency

He appears to understand simple oral material, specifically words or sentences related with his social and familiar day-to-day. On the other hand, difficulties are observed on the comprehension of longer sentences that lack visual support or that are out of the context.

Receptive-expressive language

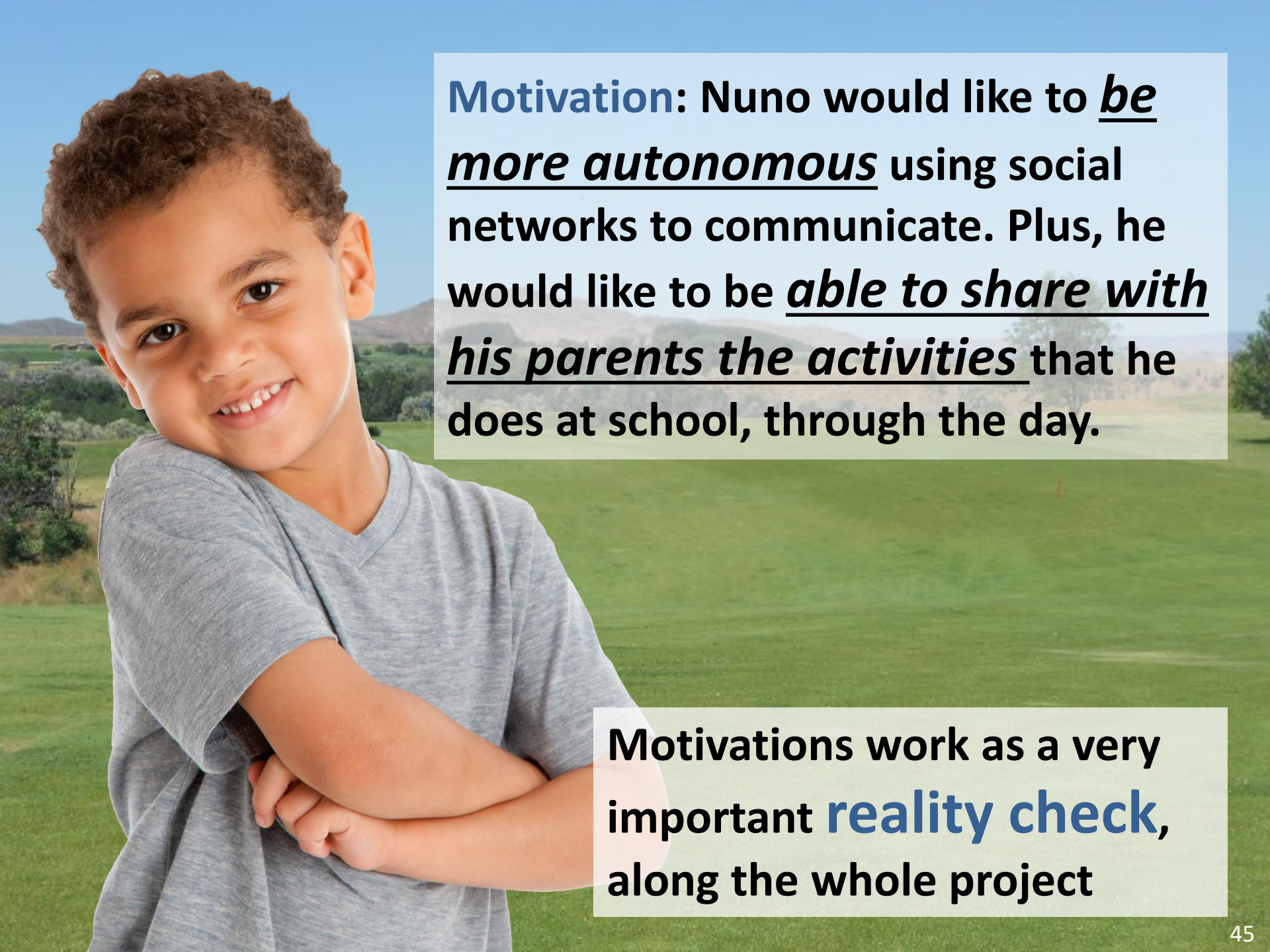
They are not about technical aspects, but about behaviours and abilities

Francisco is a 50 years old Internal Medicine Physician who obtained his degree one and a half years ago. During the courses he took he never had specific education about geriatric patients and how to diagnose them regarding the CGA. The first contact he had with it happened about one year ago, when he started his work in Aveiro's Hospital. Besides his studies, he enjoys jogging at least twice a week and going to the movies **[…]**

Motivation: Francisco would like to improve the way he applies CGA during his daily practice to enable its more extensive use.

Motivations, motivations, motivations…

https://www.merritthawkins.com



Motivation: Nuno would like to *be more autonomous* using social networks to communicate. Plus, he would like to be *able to share with his parents the activities* that he does at school, through the day.

Motivations work as a very important reality check, along the whole project

Task 02

- Register your group in eLearning (ask me for your group number)
- Tell me your project IDEA
- Identify your users and build **ONE** Persona
- Do not forget the **MOTIVATION**

Acknowledgements

Some of the slides in this presentation take inspiration and content from course materials created by Professor Beatriz Sousa Santos.