

Chapter V

Cognitive Aspects & Scientific Theories for Ergonomic



Outline

- I. Introduction
- II. Human Processor:
 - 1. Perceptuol processor
 - 2. Motor processor
 - 3. Cognitif processor
- III. Human memory
- IV. Consequences on HCLs Conception : scientific ergonomics theories
- V. Conclusion

The **objective** of this course is to give you some elements from **psychology/cognitive** science in relation to scientific theories relevant to the **design and evaluation** of interactive systems.

I. Human Processor (Card, Moran & Newell)

Theory that describes human information processing as a system with **three main processors**: perceptual, cognitive, and motor, along with associated memory systems.

1. Perceptual Processor: manages external stimuli detected by sensory receptors (sight, sound, touch, etc.) and transforms them into an internal representation that the cognitive system can use. Handles sensory input, processing external stimuli. It has a cycle time of about 100 milliseconds.



2. Cognitive Processor: Performs thinking, decision-making, and problem-solving using information from both working and long-term memory. It has a cycle time of about 70 milliseconds.



3. Motor Processor: Translates the cognitive decision into physical actions, such as pressing a button or moving a mouse. It also has a cycle time of about 70 milliseconds.



Each processor has a **memory** (capacity, persistence) and a **speed**.

1. Perceptual Processor : Sight



➤ Field of view :180°

➤ Attention Focus

visual acuity : A black line 0.04 mm thick on a white background can be easily distinguished by an individual at a distance of 50 cm.

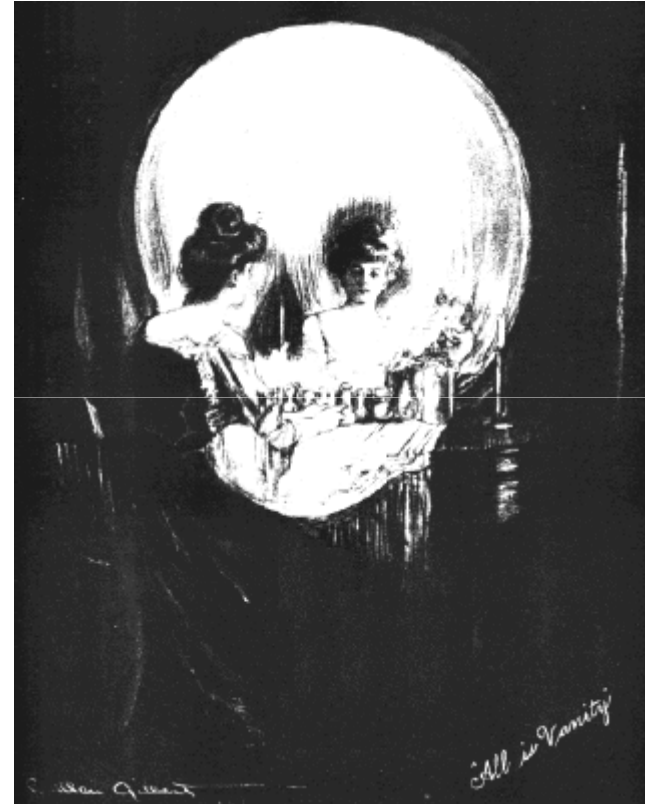
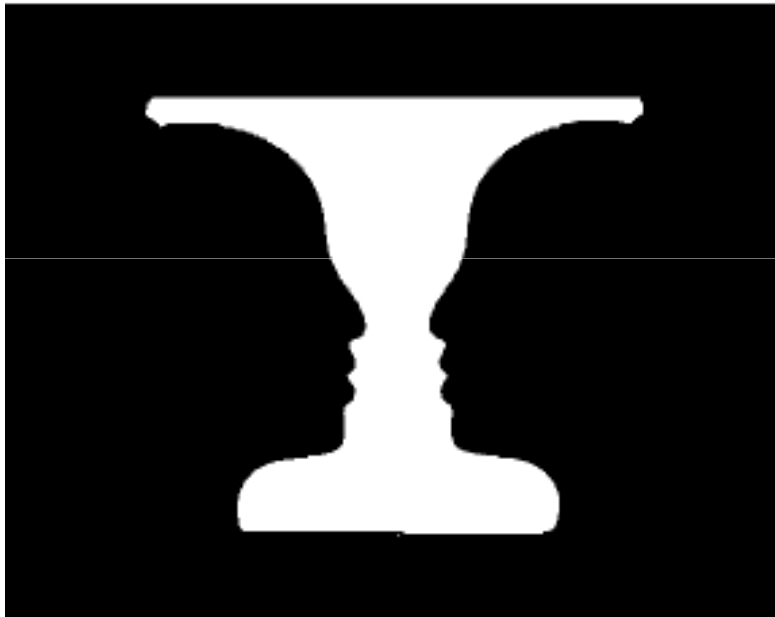
➤ Peripheral perception

less sensitive to colors, more sensitive to movements: it is often very difficult to spot a bird in a tree, but we perceive it immediately the moment it flies away.

➤ Perception of color, movement, depth (3D perception).

What do you see?

Rubin's Vase, or
The Two Faces ?



We can "trick" our visual system, as these two optical illusions demonstrate.

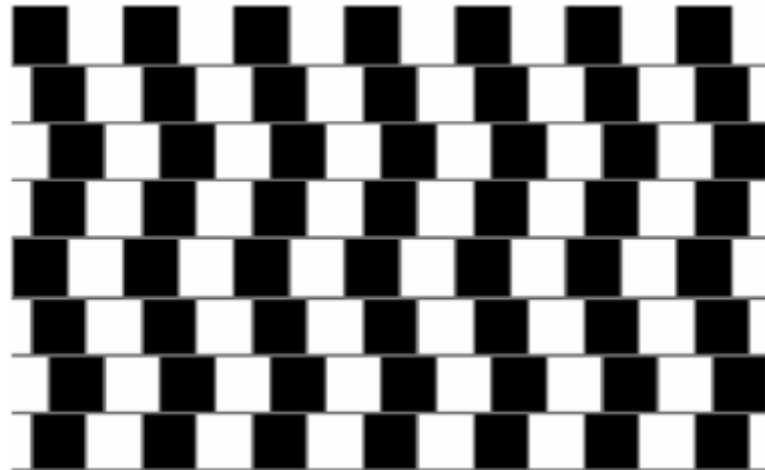
Look at this image



You will gradually see faces appear.

Once certain faces are spotted, it's impossible to stop seeing them...

Other illusions



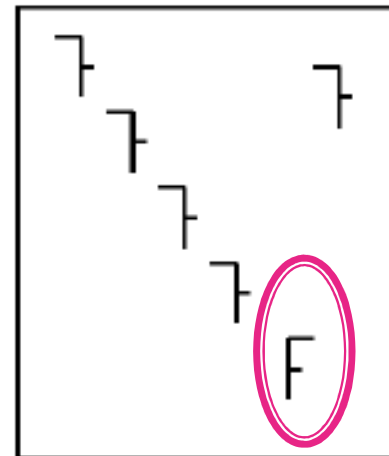
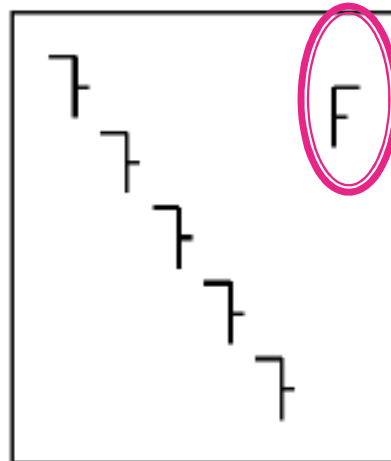
Are the "**horizontal**" lines parallel or slanted?

la cible F est mieux détectée

en **A**

qu'en

B



1. Perceptual Processor : Sight



- ❖ Memory capacity = 17 characters
- ❖ Memory persistence = 200 ms
- ❖ Processor base cycle time = 100 ms

Two stimuli separated by less than 100 ms tend to merge.

1. Perceptual Processor : Hearing

- ❖ Memory capacity = 5 characters (or equivalent)
- ❖ Memory persistence = 1500ms
- ❖ Processor base cycle time = 100ms



Despite its capabilities, hearing is rarely used by current interactive systems, aside from various beeps and recorded signals.

The current trend is toward interactive systems that use speech (multimodality).

1. Perceptual Processor : Touch

In human-computer interaction, "perceptual processing: touch" relate to the development of interfaces and systems that mimic human sensory capabilities.



Example: braille keyboard for blind and visually impaired.

1. Perceptual Processor : Touch

➤ Tactile sense

Hot, cold, pressure , Pain

➤ Proprioceptive sense

Body positioning in space, therefore perception of the shape of a grasped object.

➤ Kinesthetic sense

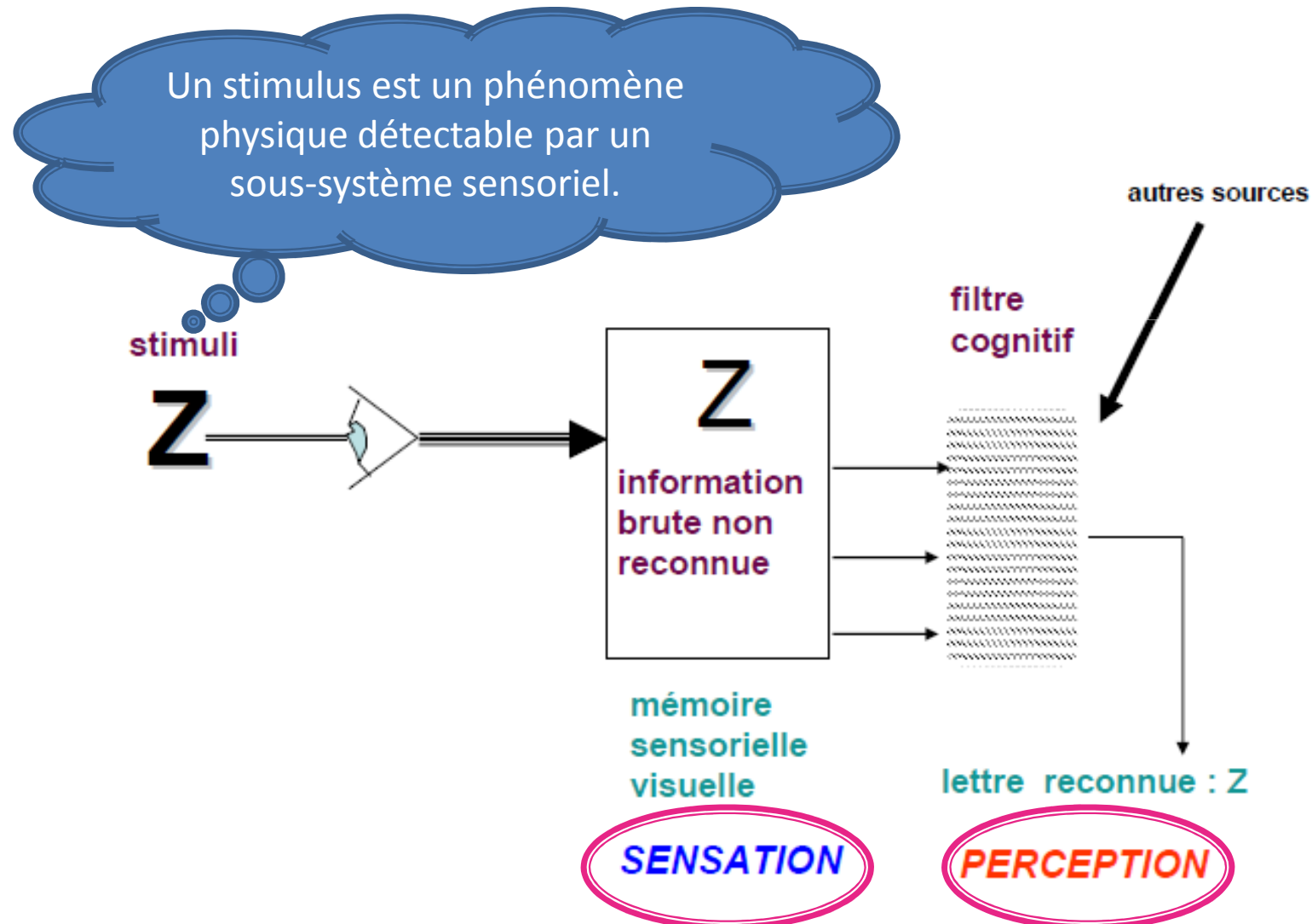
Perception of muscle effort, therefore the resistance/weight of an object.

Examples:

- ✓ using multiple **finger gestures** (one finger for manipulation, two for zooming, etc.)
- ✓ using tappers (tactors) in **gloves** to simulate the sensation of touching virtual objects in a **VR environment**.
- ✓ robots with advanced touch sensitivity to perform complex tasks like grasping objects or navigating unknown environments.

2. Cognitif processor: decision-maker

Uses the information from the perceptual system (stored in working memory) and long-term memory to make **decisions**, solve **problems**, and schedule **actions**.

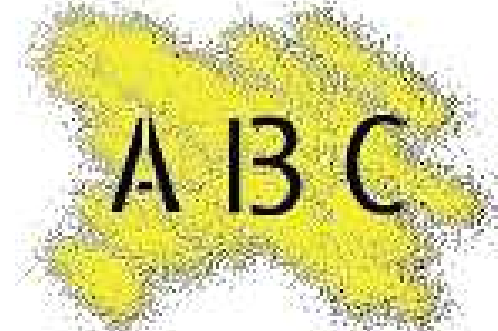
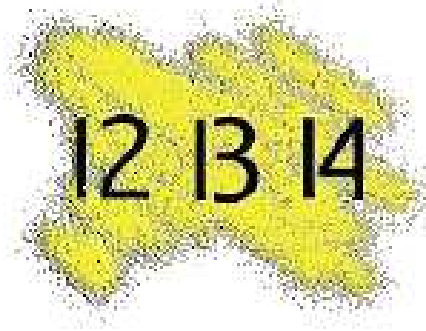
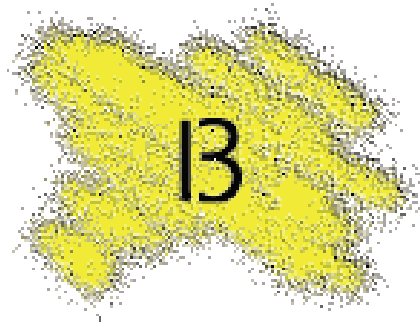


Quickly state the color of each word



Stroop effect: Interference between a primary task (identifying the color) and a cognitive process (reading a word).

Read this character



Past experience and context have an effect on how we interpret the elements of the group.

3. Motor Processor: Responsible for actions

- Translates the decisions and instructions from the cognitive system into physical actions, such as moving a mouse, typing on a keyboard, using a gesture, or giving a voice command.
- It has a specific processing time (around 70 milliseconds).

II. Human Memory

How is information stored ?

Human Processor

- ❖ 3 processors

- ☐ Perceptual ou sensory
- ☐ Cognitif
- ☐ Motor

- ❖ Memory hierarchy

- ☐ working memory (RAM)
 - Sensory memory
 - Short-term memory
- ☐ Long-term memory

Sensory Memory

- Sensory register (buffer), is a **brief collection** of information (stimuli) from our senses. This includes hearing, touch, smell, taste and vision.
- These memories are constantly **overwritten** as information reaches us.
- **Information is transferred** to **short-term memory** if it is deemed worthy of being received.

Short-term Memory

Holds information being manipulated, like the registers of a computer.

Example : calculate 35×6

An other test : look at this series



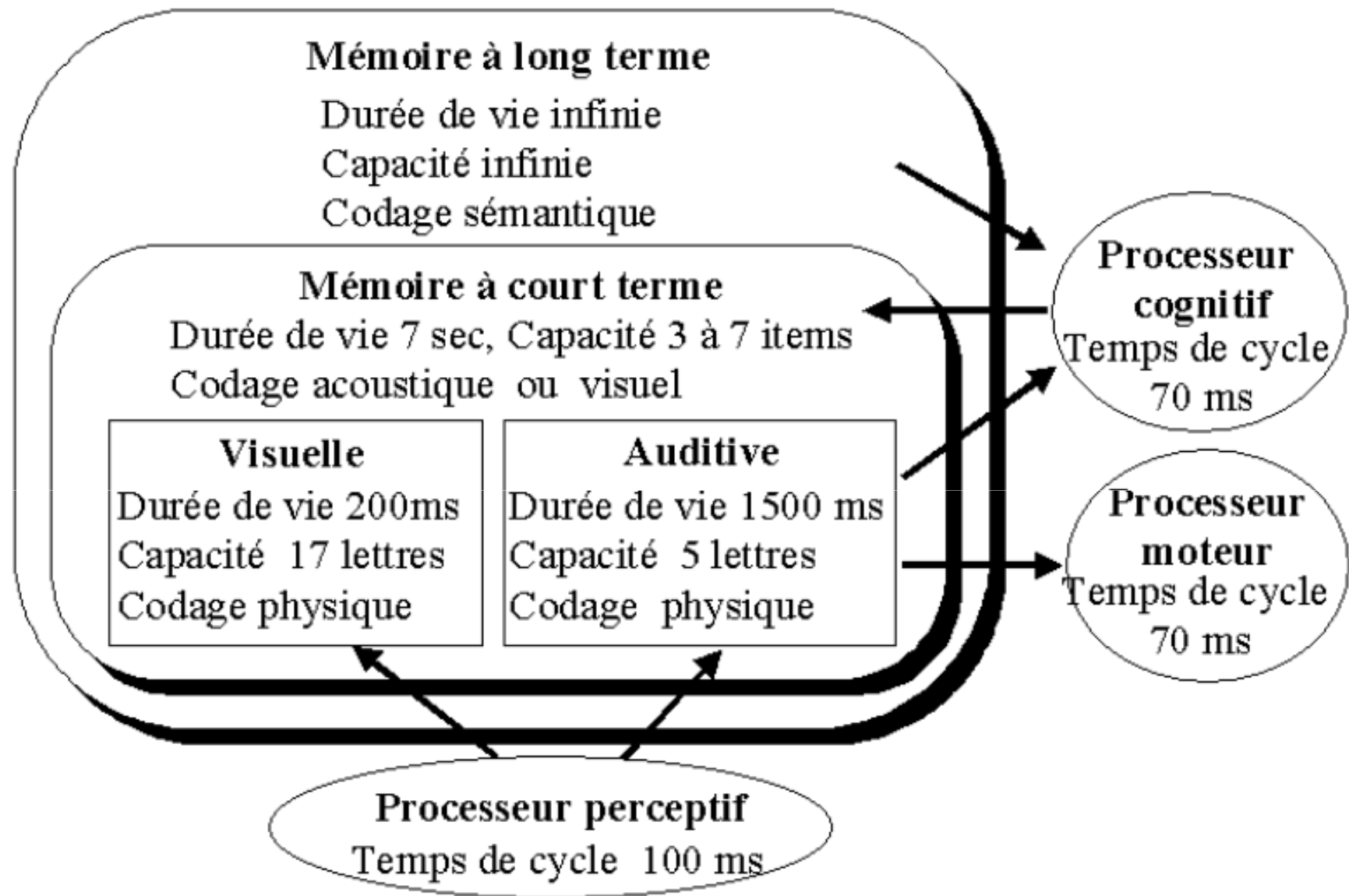
Now, write down as many numbers as possible .
How much?

Characteristics

- ☐ Working memory
- ☐ Capacity for a few items (7 ± 2)
- ☐ Storage time: 10 to 30 seconds

Long-term Memory

- Our principal memory.
- Informations, experiences, and knowledges are stored there.
- **Characteristics**
 - ❑ Very large (unlimited) capacity,
 - ❑ Relatively long access time (1/10s),
 - ❑ Forgetting occurs more slowly,

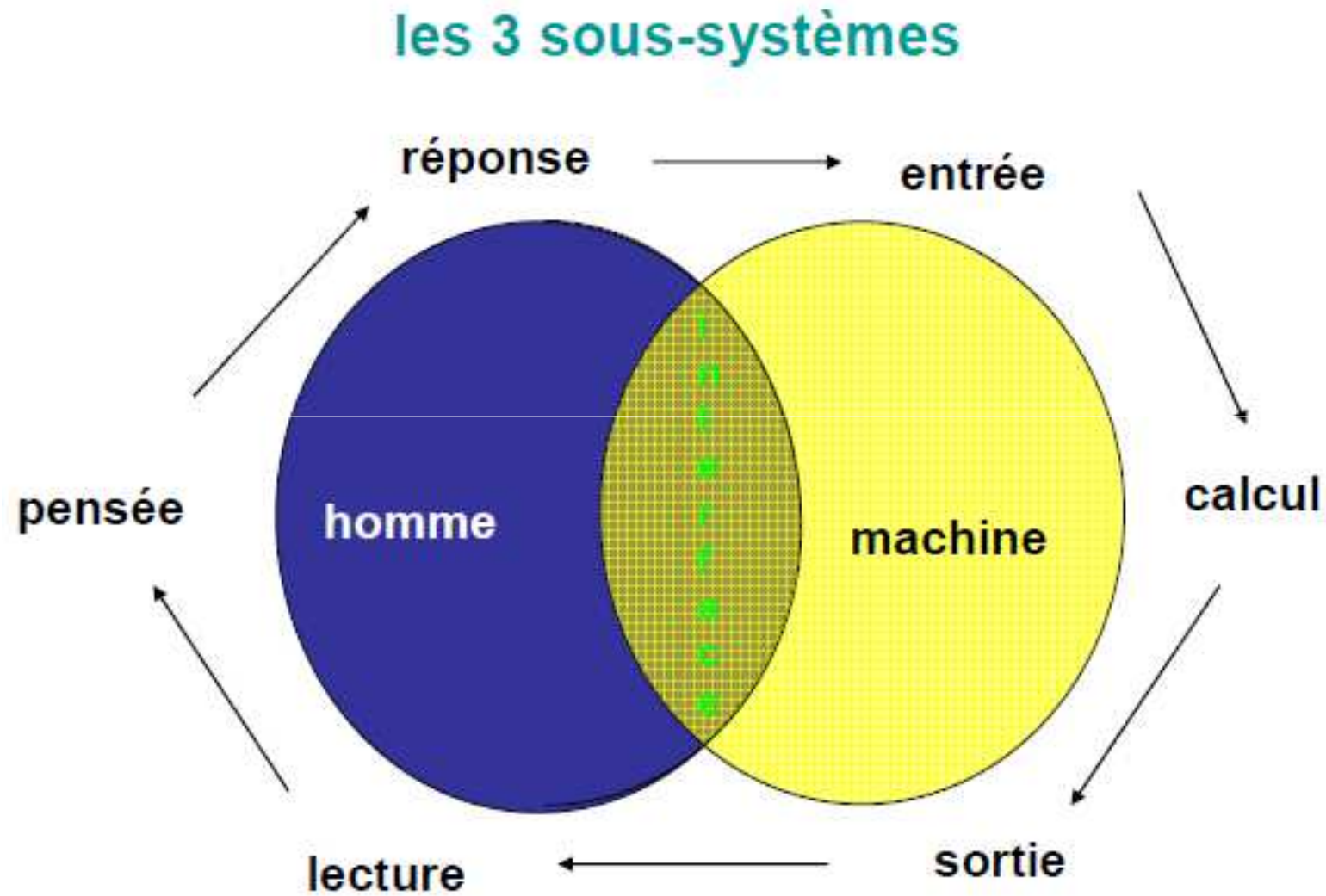


The Model Human Processor

This model outlines a flow where **sensory input** is processed **perceptually**, interpreted **cognitively**, and translated into physical **actions**.

The **action changes** the state of the computer system, which then **provides feedback** that the user perceives, **restarting the cycle**.

Representing the individual vs. computers



III. Scientific Theories for ergonomic

Theory 1: Memory

Theory 2: Magical Miller's Number

Theory 3: Hick law

Theory 4: The 2-Second Principle

Theory 5: 3-Click Principle

Theory 6: Baby Duck syndrome (ou du rétroviseur)

Theory 7: Potentiality (Affordance)

Theory 8: Perception

Theory 9: Colors

Theory 10: On-screen reading

Theory 11: Fitts's Law

Theory 12: Text Display

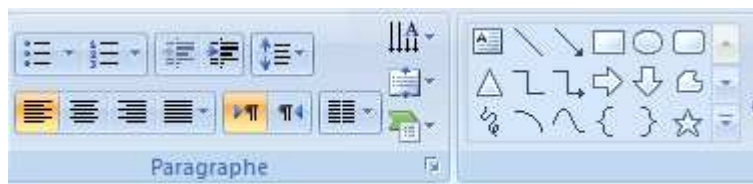
Theory 1: Memory

Long-term vs. Short-term

Short-term memory :

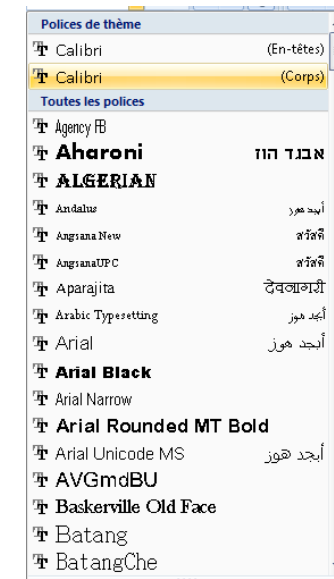
Users **struggle** to remember information.

- ▶ Grouping related items
 - ▶ Visuals
 - ▶ letters, numbers, words
 - ▶ forms, size
 - ▶ color, localization
 - ▶ Acoustic
 - ▶ beginning sound, ...
 - ▶ number of syllables, ...



Long-term memory :

- ▶ Use repetition and association,
- ▶ Use dual coding,
- ▶ Use constant elements, ...



Theory 2: Miller's Magical Number, 1956

- This law states that the average person can only hold about **7 items +/-2 (so a range of 5 to 9)** in their short-term or working memory at one time.
- Anything beyond this limit can lead to **cognitive overload** and make information **difficult to remember** or process effectively.



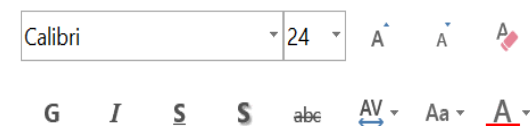
lundi
mardi
mercredi
jeudi
vendredi
samedi
dimanche

► Risks

The user forgets, wastes time searching particularly for infrequently used software.

► Solutions

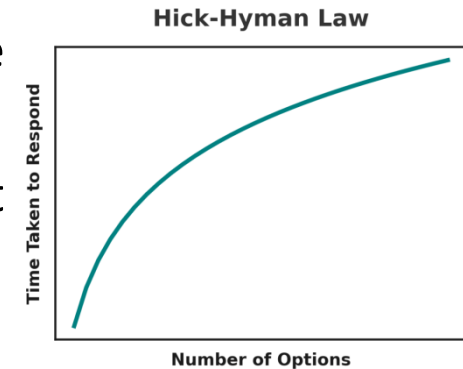
- Limit the number of objects to memorize to 7
- No unnecessary information
- Establish links between elements via color, format, location...



Theory 3: Hick Law

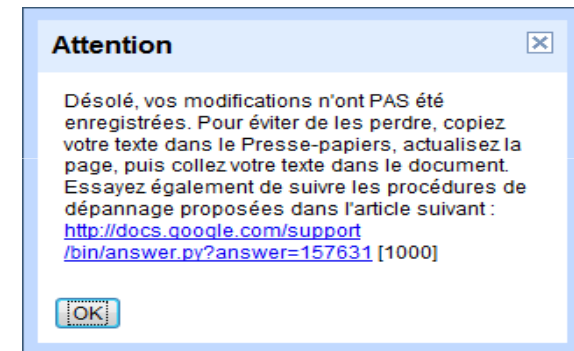
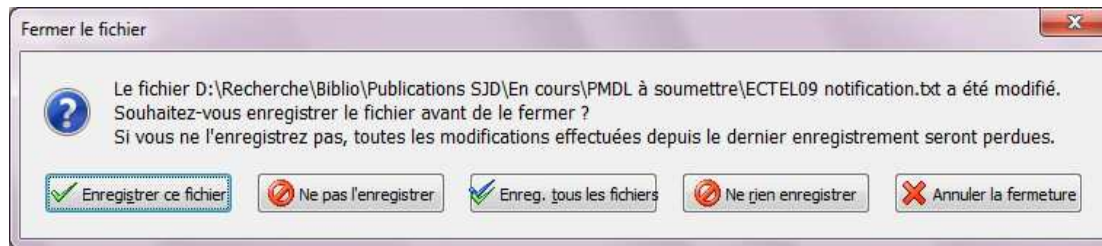
States that decision time increases logarithmically as the number of choices increases.

Suggests that **fewer options** lead to **faster decisions**, a concept used to guide interface design.



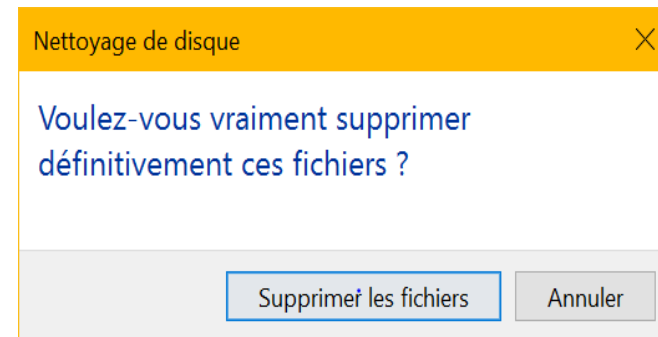
► Risks

- The user can make a mistake, waste time.



► Solutions

- Limit the number of items,
- Avoid unnecessary information,
- Use concise messages..



Theory 3: Hick Law

Language used

- ▶ Avoid dead ends
- ▶ Use the user's language
- ▶ Avoid abbreviations
- ▶ Respect the order of actions
- ▶ Messages should be:

- ✓ concise
- ✓ consistent
- ✓ active voice
- ✓ affirmative
- ✓ clear and explicit
- ✓ polite

Hauteur

1,91"



L'exception Point d'arrêt
Un point d'arrêt a été atteint.
(0x80000003) s'est produite dans l'application à l'emplacement
0x77af697f.

Ignorer l'e-mail

Enregistrer cet e-mail
dans les brouillons ou le
supprimer ?

ANNULER IGNORER ENREG.

☐ Case à cocher pour recevoir les conseils

Utilisez le raccourci **Ctrl+V** pour coller. Votre
navigateur n'accepte pas de coller à l'aide du
bouton ou du menu contextuel.

69100

CALCULER

Something went wrong...

Some Documents have not Been Saved

Save? Document

<input checked="" type="checkbox"/>	Book2.gnumeric	Location: file:///home/exco/ENSEIGNEMENT/SERVEUR_NOTES/LOCAL/Book2.gnum...
<input checked="" type="checkbox"/>	xxx_stats.csv	Location: file:///home/exco/ENSEIGNEMENT/SERVEUR_NOTES/LOCAL/xxx_stats.csv

Select all Clear Selection Save Selected Don't Quit

- ☒ Afficher une vue simple des dossiers dans la liste des dossiers
- ☐ Masquer les extensions des fichiers dont le type est connu
- ☐ Mémoriser les paramètres d'affichage de chaque dossier
- ☒ Ne pas mettre les miniatures en cache

Une erreur s'est produite, veuillez nous en excuser.

Pour éditer votre attestation destinée aux services fiscaux (format PDF)
[Cliquez sur ce lien](#)

Le mot de passe d'origine est identique à celui que vous souhaitez personnaliser... quel intérêt ?

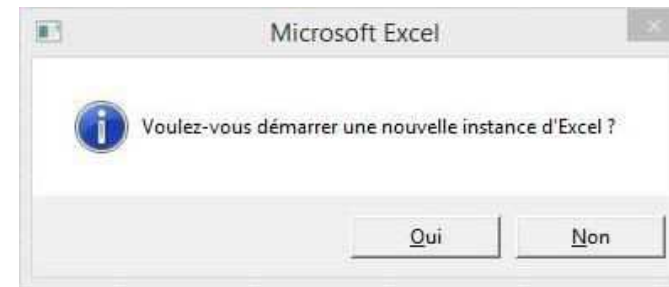
Theory 4: The 2-Second Principle

► Principe

- Do not wait more than 2 seconds for the system to respond.

► Risques

- L'utilisateur peut relancer l'action,
- Bugs or error messages.



► Solutions

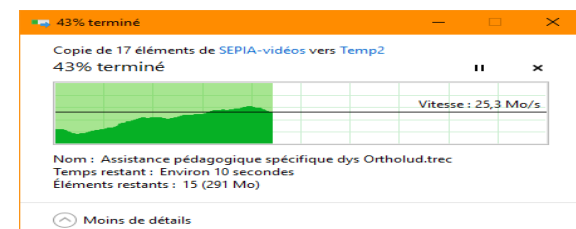
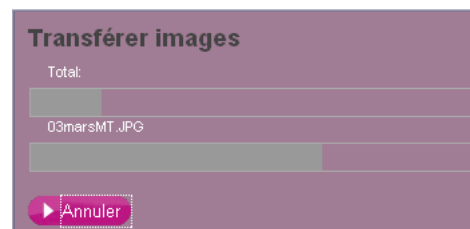
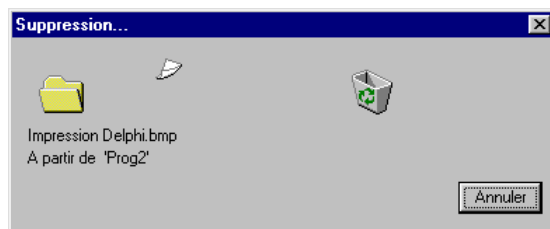
- Quick actions: indicators of actions taken.



Traitement 90%



- Long-term actions: dynamic indicators of ongoing action.



Theory 5: 3-Click Principle

► Principe

► The desired information must be accessible:

✓ in 3 clicks (web)

✓ quickly



► Risques

► The user can abandon the task /application

► Solutions

► Make important actions accessible directly or at least quickly

► Adapt to the situation



Theory 6: Baby Duck syndrome (du rétroviseur)



► Principe

- refers to a user's tendency to prefer the first software interface they learned and to judge new versions negatively.
« c'était mieux avant »

► Risques

- ✓ Rejection of new applications/versions,
- ✓ Problem for innovations, software evolution.



La touche Menu a été remplacée par la touche Applications récentes pour vous permettre d'accéder aux applications récemment utilisées. Appuyez sur Aide pour obtenir plus d'informations.

☐ Ne plus afficher

Aide

OK

► Solutions

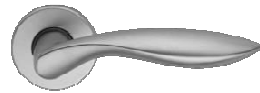
- Evolution within consistency,
- Supporting change

Theory 7: Potentiality (Affordance)

Principle

refers to the **relationship** between an object's properties and a user's capabilities that suggests how the object can be used.

► Signs implicit



or explicit



► Risques

- Hesitation, waste of time
- non-use



► Solutions

- Help distinguish between clickable and non-clickable elements
- Encourage user interaction
 - ✓ Shape, label, color, location, behavior



Parcourir...

Enregistrer

Enregistrer

Envoyer

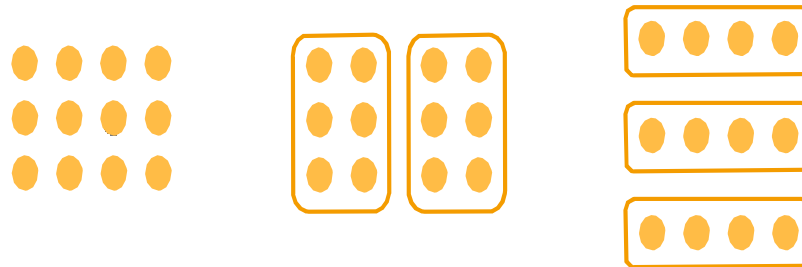
Annuler

Theory 8: Gestalt Theory

Proximity

► Proximity Law

- The brain tends to **associate** things that are **physically close**.



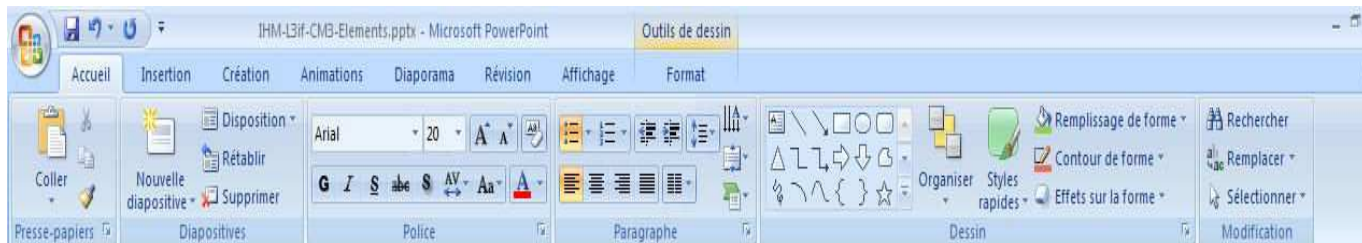
► Risques

- To associate opposing concepts / actions



► Solutions

- Bring together similar elements / separate different elements

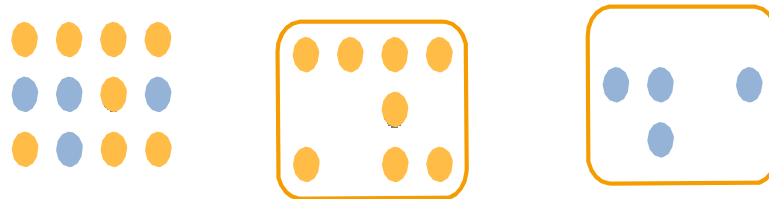


Theory 8: Gestalt Theory

Similarity

► Similarity Law

- The brain tends to **associate** things that are **similar** (based on shape, color, size, behavior...)



► Risques

- Confusing similar objects



► Solutions

- Associate commonalities with similar elements
- Mark the different elements with specific characteristics



Étymologie [\[modifier \]](#) [\[modifier le code \]](#)

Le terme « ergonomie » vient du **grec ancien** *ἐργον* / *érgon* (« travail ») et *νόμος* / *nómos* (« loi »).

Le terme est créé par deux fois au cours du XIX^e siècle dans deux contextes théoriques distincts : d'abord en 1857 par Wojciech Jastrzebowski qui publie en polonais le premier « Précis d'Ergonomie » qui n'est que faiblement diffusé, puis en français (1858) par Jean-Gustave Courcelle-Seneuil³.

Theory 9: a) Color readability

Lisibilité des couleur

► Principe

- **high** contrast between text and background
- **Dark** characters on a **light** background
 - ✓ Preferably black characters on a white background
 - ✓ Except in low-light environments (night, specific tasks)
 - ✓ Limited number of colors

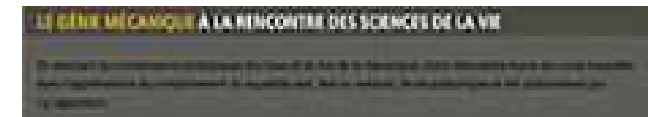
Interface
graphique

Interface
graphique

► Risques

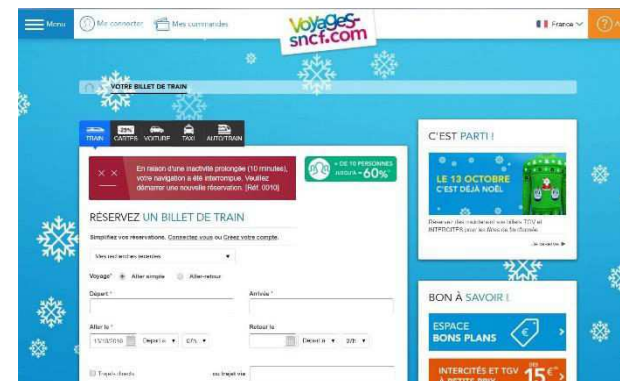
- Insufficient contrast which limits readability

 Date livraison manquante. Zone: Date livraison



► Solutions

- Avoid certain color combinations
- Limit the number of colors



Théorie 9: b) Meaning of colors

Signification des couleurs

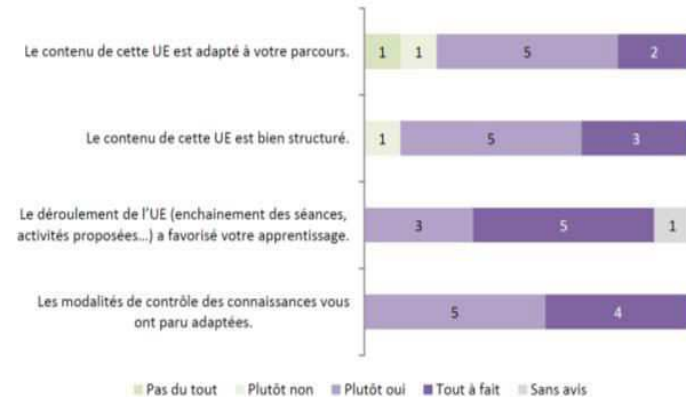
► Principe

- The colors have a common meaning.



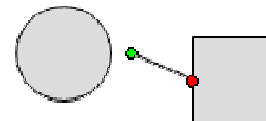
- example : red= stop / green= go

- en chine, red= joie



► Risques

- Misunderstanding of the interface
- Misinterpretation of the color code



► Solutions

- Follow standard color codes
 - ✓ Green: validation, success
 - ✓ Red: alert, stop, failure
- use neutral colors if there is no specific need
- Pay attention to local and cultural specificities.

Success!

Danger!



Click ME!

Théorie 9: c) Relevance of colors

Pertinence des couleurs

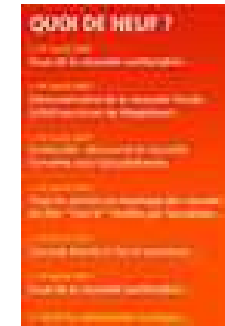
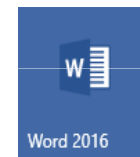
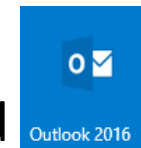
► Principe

Using colors to signify something in a relevant way

► Niveau de sécurité :     Elevé

► Risques

- Objects of the same color incorrectly associated
- Colors not/misperceived



► Solutions

Same type of information,



same color

Different types of information,



contrasting colors

Similar types of information,



low-contrast colors

Combine/clarify the information



Très Satisfait Très Satisfait plutôt Satisfait Peu Satisfait Pas Satisfait

Le choix du nombre de Points Relais® proposés à proximité



Théorie 9: d) Color portability

Portabilité des couleurs

► Principe

- The information conveyed by color must be available everywhere, always, for everyone.



► Risques

Poor color rendering (distinction, contrast, number of colors)

- ✓ in certain contexts (outdoors, at night)
- ✓ depending on the screen, the device (video projectors, smartphones)
- ✓ for some users (color blindness): 8-10% of men, 0.5% of women



► Solutions : interface testing tools

- Consistently contrasting colors
 - Contrast Checker
- Color set suitable for color blindness
 - outils de test : ColorOracle (desktop), ColorBlindness SimulateCorrect (mobile), Colorblind Web Page Filter (web)

Theory 10: On-screen reading

« Parcours »

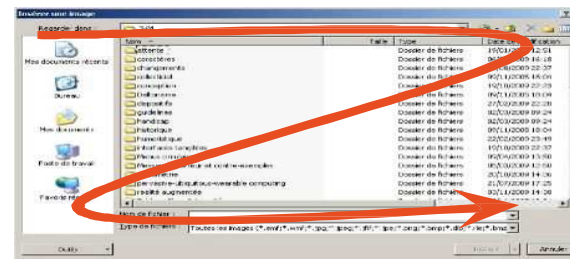
► Technique

- ✓ eye-tracking
- ✓ Online eye-tracking simulator



Screen navigation

- ✓ First screen view
 - Z-shaped scan
- ✓ Then Selective scan
- ✓ Search engine
 - F-shaped / comb



Theory 10: On-screen reading

«Above the fold»

► Principle

The main information must be visible "above the fold"

- Title of a newspaper, even when folded,
- Main content of a web page before scrolling.



Université Claude Bernard Lyon 1

L3HIM: Interactions Homme-Machine en Licence Informatique de l'UCBL

Interaction Homme-Machine et L'usage de l'écrit

Conservation de l'écrit (pdf)

Cette UE aborde les concepts d'interface homme-machine, d'interaction homme-machine et d'ergonomie. L'enseignement repose sur des ateliers, activités en équipe sous forme de TD et mise en situation en TP. La forme des activités est parfois atypique. L'ouverture d'esprit est fortement recommandée !

Sujets de cours	Sujets de TD et TP	Sujets d'examen
CAS Introduction à l'UE	Consignes de rendu (TP/TP)	Sujet 1 (pdf)
CAS Introduction à l'UE	Consignes de rendu (TP/TP)	Sujet 2 (pdf)
CAS Introduction à l'UE	Consignes de rendu (TP/TP)	Sujet 3 (pdf)
CAS Introduction à l'UE	Consignes de rendu (TP/TP)	Sujet 4 (pdf)
CAS Introduction à l'UE	Consignes de rendu (TP/TP)	Sujet 5 (pdf)
CAS Introduction à l'UE	Consignes de rendu (TP/TP)	Sujet 6 (pdf)
CAS Introduction à l'UE	Consignes de rendu (TP/TP)	Sujet 7 (pdf)
CAS Introduction à l'UE	Consignes de rendu (TP/TP)	Sujet 8 (pdf)
CAS Introduction à l'UE	Consignes de rendu (TP/TP)	Sujet 9 (pdf)
CAS Introduction à l'UE	Consignes de rendu (TP/TP)	Sujet 10 (pdf)
CAS Introduction à l'UE	Consignes de rendu (TP/TP)	Sujet 11 (pdf)
CAS Introduction à l'UE	Consignes de rendu (TP/TP)	Sujet 12 (pdf)
CAS Introduction à l'UE	Consignes de rendu (TP/TP)	Sujet 13 (pdf)
CAS Introduction à l'UE	Consignes de rendu (TP/TP)	Sujet 14 (pdf)
CAS Introduction à l'UE	Consignes de rendu (TP/TP)	Sujet 15 (pdf)
CAS Introduction à l'UE	Consignes de rendu (TP/TP)	Sujet 16 (pdf)
CAS Introduction à l'UE	Consignes de rendu (TP/TP)	Sujet 17 (pdf)
CAS Introduction à l'UE	Consignes de rendu (TP/TP)	Sujet 18 (pdf)
CAS Introduction à l'UE	Consignes de rendu (TP/TP)	Sujet 19 (pdf)
CAS Introduction à l'UE	Consignes de rendu (TP/TP)	Sujet 20 (pdf)

TD1 Conception

Sur l'activité de 5, vous allez concevoir la V2 de l'application mobile. Ce vous demande en effet de rendre l'application plus ludique (chasse au trésor, défis, récompenses...). Support: une ... pdf

Sur la page 6, vous allez concevoir la V2 de l'application mobile. Ce vous demande en effet de rendre l'application plus ludique (chasse au trésor, défis, récompenses...). Support: une ... pdf

Le 1-1-18, une vidéo de démonstration de l'application, respectant les ... La vidéo devra bien mettre en valeur les différents fonctionnalités de l'application, en montrant le processus réalisé.

Adresser la démonstration des consignes précédentes: 2012-2013, 2013-2014, 2014-2015, 2015-2016, 2016-2017, 2017-2018, 2018-2019, 2019-2020, 2020-2021, 2021-2022, 2022-2023, 2023-2024, 2024-2025, 2025-2026, 2026-2027, 2027-2028, 2028-2029, 2029-2030, 2030-2031, 2031-2032, 2032-2033, 2033-2034, 2034-2035, 2035-2036, 2036-2037, 2037-2038, 2038-2039, 2039-2040, 2040-2041, 2041-2042, 2042-2043, 2043-2044, 2044-2045, 2045-2046, 2046-2047, 2047-2048, 2048-2049, 2049-2050, 2050-2051, 2051-2052, 2052-2053, 2053-2054, 2054-2055, 2055-2056, 2056-2057, 2057-2058, 2058-2059, 2059-2060, 2060-2061, 2061-2062, 2062-2063, 2063-2064, 2064-2065, 2065-2066, 2066-2067, 2067-2068, 2068-2069, 2069-2070, 2070-2071, 2071-2072, 2072-2073, 2073-2074, 2074-2075, 2075-2076, 2076-2077, 2077-2078, 2078-2079, 2079-2080, 2080-2081, 2081-2082, 2082-2083, 2083-2084, 2084-2085, 2085-2086, 2086-2087, 2087-2088, 2088-2089, 2089-2090, 2090-2091, 2091-2092, 2092-2093, 2093-2094, 2094-2095, 2095-2096, 2096-2097, 2097-2098, 2098-2099, 2099-2100, 2100-2101, 2101-2102, 2102-2103, 2103-2104, 2104-2105, 2105-2106, 2106-2107, 2107-2108, 2108-2109, 2109-2110, 2110-2111, 2111-2112, 2112-2113, 2113-2114, 2114-2115, 2115-2116, 2116-2117, 2117-2118, 2118-2119, 2119-2120, 2120-2121, 2121-2122, 2122-2123, 2123-2124, 2124-2125, 2125-2126, 2126-2127, 2127-2128, 2128-2129, 2129-2130, 2130-2131, 2131-2132, 2132-2133, 2133-2134, 2134-2135, 2135-2136, 2136-2137, 2137-2138, 2138-2139, 2139-2140, 2140-2141, 2141-2142, 2142-2143, 2143-2144, 2144-2145, 2145-2146, 2146-2147, 2147-2148, 2148-2149, 2149-2150, 2150-2151, 2151-2152, 2152-2153, 2153-2154, 2154-2155, 2155-2156, 2156-2157, 2157-2158, 2158-2159, 2159-2160, 2160-2161, 2161-2162, 2162-2163, 2163-2164, 2164-2165, 2165-2166, 2166-2167, 2167-2168, 2168-2169, 2169-2170, 2170-2171, 2171-2172, 2172-2173, 2173-2174, 2174-2175, 2175-2176, 2176-2177, 2177-2178, 2178-2179, 2179-2180, 2180-2181, 2181-2182, 2182-2183, 2183-2184, 2184-2185, 2185-2186, 2186-2187, 2187-2188, 2188-2189, 2189-2190, 2190-2191, 2191-2192, 2192-2193, 2193-2194, 2194-2195, 2195-2196, 2196-2197, 2197-2198, 2198-2199, 2199-2200, 2200-2201, 2201-2202, 2202-2203, 2203-2204, 2204-2205, 2205-2206, 2206-2207, 2207-2208, 2208-2209, 2209-2210, 2210-2211, 2211-2212, 2212-2213, 2213-2214, 2214-2215, 2215-2216, 2216-2217, 2217-2218, 2218-2219, 2219-2220, 2220-2221, 2221-2222, 2222-2223, 2223-2224, 2224-2225, 2225-2226, 2226-2227, 2227-2228, 2228-2229, 2229-2230, 2230-2231, 2231-2232, 2232-2233, 2233-2234, 2234-2235, 2235-2236, 2236-2237, 2237-2238, 2238-2239, 2239-2240, 2240-2241, 2241-2242, 2242-2243, 2243-2244, 2244-2245, 2245-2246, 2246-2247, 2247-2248, 2248-2249, 2249-2250, 2250-2251, 2251-2252, 2252-2253, 2253-2254, 2254-2255, 2255-2256, 2256-2257, 2257-2258, 2258-2259, 2259-2260, 2260-2261, 2261-2262, 2262-2263, 2263-2264, 2264-2265, 2265-2266, 2266-2267, 2267-2268, 2268-2269, 2269-2270, 2270-2271, 2271-2272, 2272-2273, 2273-2274, 2274-2275, 2275-2276, 2276-2277, 2277-2278, 2278-2279, 2279-2280, 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Theory 11: Fitts's Law

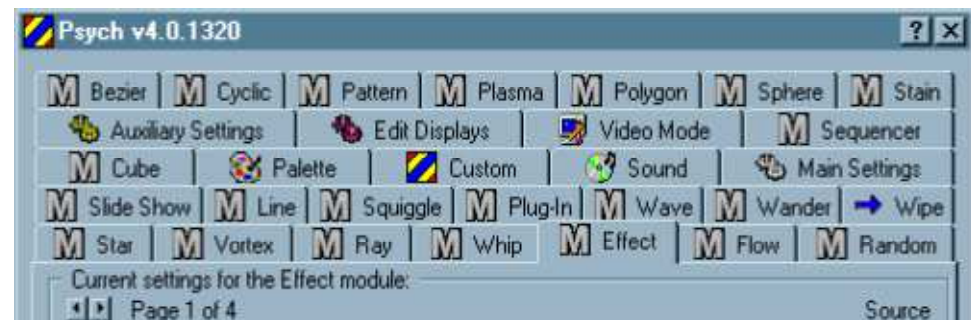


► Principle

a predictive model stating that the **time** it takes a **pointer** (such as a mouse cursor, a human finger, or a hand) to **move to** and **select** a target(ex.button) depends on the **distance** to the target and its **size**.

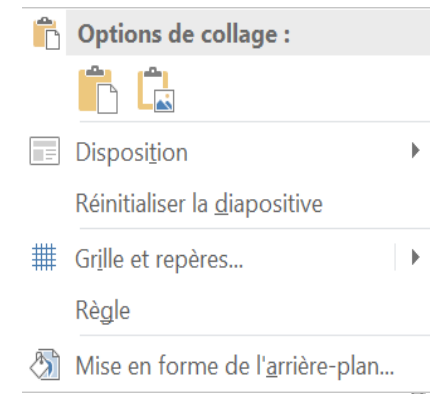
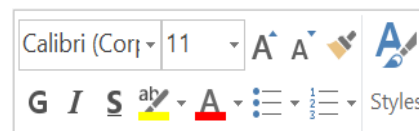
► Risques

- Wasted time,
- Clicks outside the target.



► Solutions

- Respect the screen layout
- Adapt sizes and locations
- Context menus



$$t = 0.1 \log 2D/L$$

D (cm)	L (cm)	t (s)
10	1	0.4
10	0.1	0.8
30	0.5	0.7



t : mouvement time

D: distance to the target

L: width of the target

Theory 12: Text Display

► Principles of typography

- Sans-serif fonts are more readable on screen
 - (Arial, Calibri, Helvetica, Geneva...)
- Styles slow down reading, making it less readable:
 - **gras**
 - *italics*
 - Underlined (+ confusion with links)
 - CAPITAL LETTERS
- ban the **JUMPSUITS**

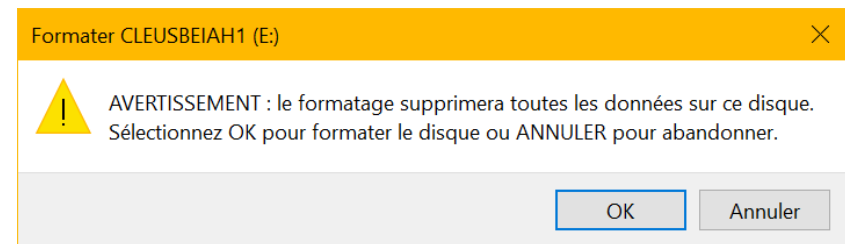


► Risques

- Loss of readability
- Slower reading

► Solution

Use styles to highlight certain elements only



V. Conclusion

Interfaces often assume that their user:

1. has two hands
2. can see and hear and has good motor control
3. is intelligent and resourceful
4. can read and understand English
5. is familiar with the conventions of typical GUIs
6. is motivated to learn how to use the interface
7. has the time to solve problems when they arise

But...

What **percentage** of the population has all of these **characteristics**?

V. Conclusion (suite)

1. Don't assume you know what's best for the user.
2. Don't assume you know all of the user's goals, tasks, and habits.
3. From a certain perspective, the user's time is more valuable than the programmer's or designer's time

Questions ...