



We connect people, ideas and territories
with our resources, research and expertise





Research Life Natura Road Signs Production and Efficiency

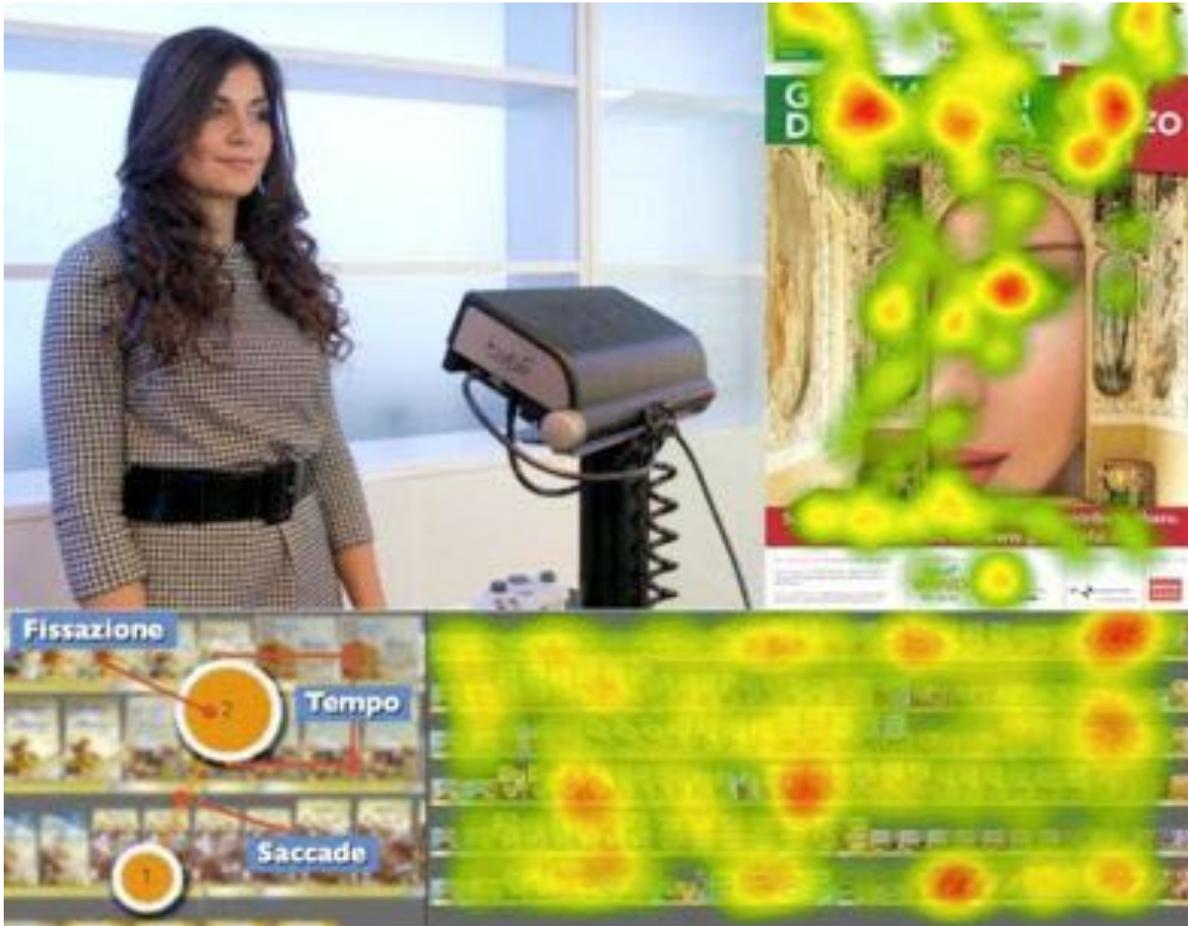
This research intends to create and study how road signs could be improved through the use of applied neuroscience.

Which work tools do we use?



We use neuroscientific tools coupled with traditional methodologies: we want to give a complete meaning to people's experience.

Eye-tracking



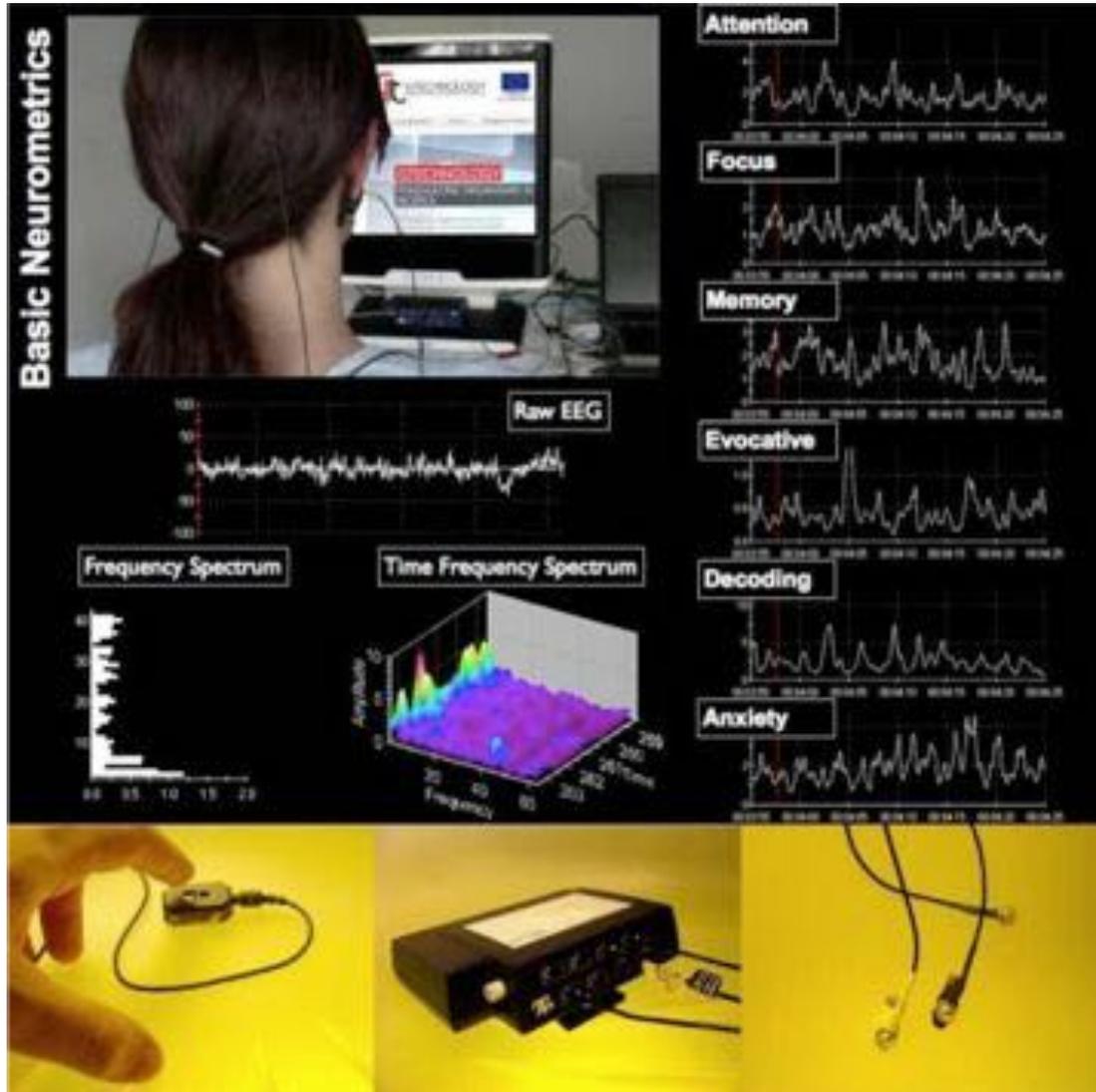
Eye-tracking records eye movements, measuring the corneal reflection through infrared light.

It allows to know:

- what a person is looking any time
- how this person collects information that will be elaborated by brain
- how many time this person lingers on details

It helps us to understand which strategies are the most quick, immediate and incisive

EEG Electroencephalogram



EEG records changes in electrical potential generated by brain.

It allows to measure when people:

- are attentive
- memorize
- refer to knowledges that are already present in memory
- struggle to elaborate information

It helps us to understand which contents are easy and coherent depending on predetermined aims.

Post test Qualitative interview

It is the tool used to deepen people's experiences and the meaning they give to them.

It is essential to:

- examine the drivers at the bottom of people's choices
- understand their opinions: what people think about a concept/theme and how they tell about this concept with the others (word of mouth)



Joint to Eye-tracker and EEG, it allows us to recreate all the experiential flow and to understand how to make the communication easy and direct

Research Objectives and Methodologies

Objective	ET	EEG	QL INT
Which creative hypothesis is more effective?	V	V	
Which communication objects don't work?	V	V	V
Is my message understood as I would like?			V
Does the overall message achieve its purpose?		V	V
How can I improve the creatives hypotheses?	V	V	V

Creative Hypotheses



1_SILHOUETTE

2_CAR

3_MORGUE

4_CROSSING

1_ITALIAN



2_GREEK



3_ROMANIAN



4_SPANISH





1st phase



2nd phase



3rd phase



4th phase

Every hypothesis has been shown, in full screen, approaching.

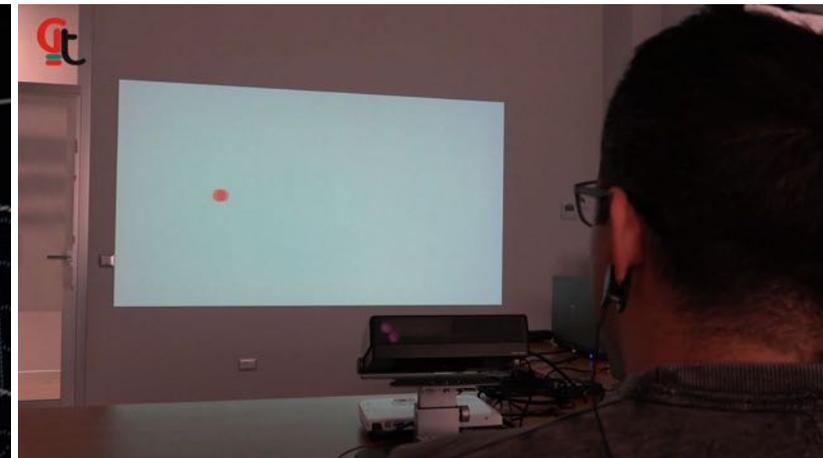
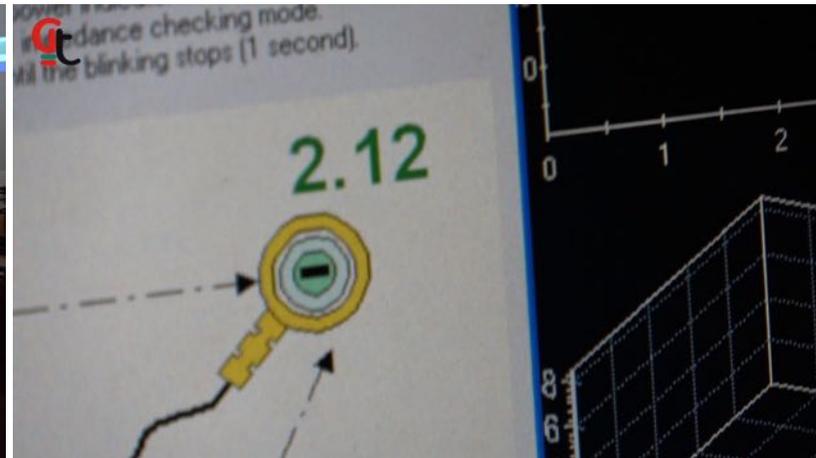
The 1-3 phases recreate the sequence of vision like a real ambientation.

Phase 4 is a fullscreen image useful for checking the objects' visibility and cognitive perception.

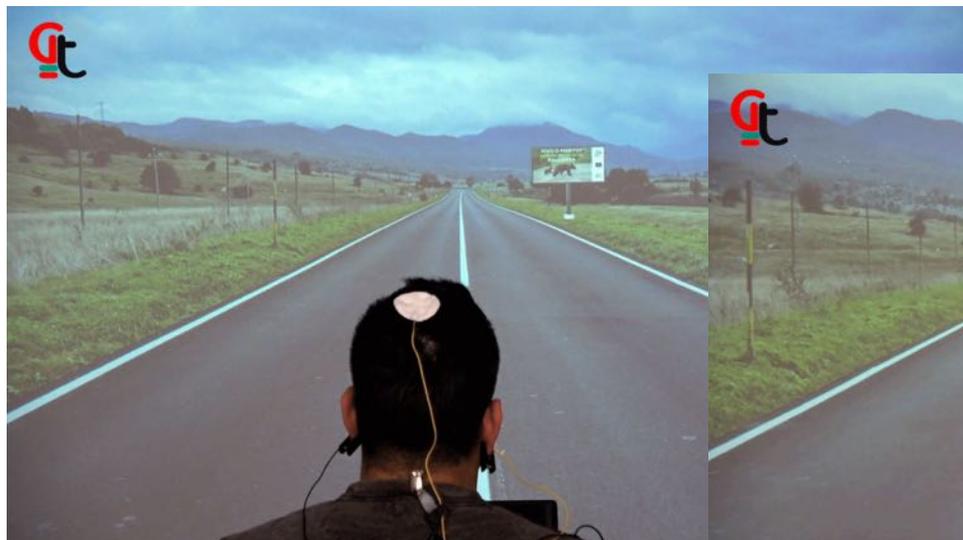
Between one creativity and another there were ads to distract the sample.

The viewing order has been in programmed rotation to avoid the "order effect".

Field Test



Sample



The test was conducted in Italy, with a sample of **32 native speaking participants**, owners of driving licences; they usually use the car for trip:

- 8 Italian (4 Men and 4 Women)
- 8 Spanish (4 Men and 4 Women)
- 8 Greek (4 Men and 4 Women)
- 8 Romanian (4 Men and 4 Women)

All the participants were exposed to all the stimuli.

EEG and Eye Tracking Metrics

	Metrics	Definition	Threshold		
Eye-Tracking	Participants (N)	It's the number of participants (sample) who have looked at the area of interest.	Step 1 <19	Step 2 <26	Step 3 <30
	Visibility FixTarget/FixTot (%)	It's the visual attention in target (%). It's calculated as follow: Fixations in target/Total Fixations.	Descending	Lower than others	Higher than others
	Fixations Duration (ms)	It's the average time devoted to the observation of an object. If it's less than 200 ms. is not effective, if it is higher than 500 ms. indicates a difficulty of understanding.	<200		>500
EEG	Attention [0-100]	The participant is ready to receive stirrings from the outside world, is open and receptive.			
	Learning [0-100]	The participant is ready to learn and memorize and it's a phase of upgrading knowledge. If learning and attention are activated at the same time the user perceives the stirring as New.			
	Evocative [0-100]	The participant connects and compares the stimulus with its previous experience (familiarity with the brand, with the site, habits, practices, influence of advertising).	<=48	48<X<52	>=52
	Simplicity [0-100]	Indicates that the communication stirring is comprehensible and immediacy. If it is off, the subject is in a state of cognitive fatigue.			
	Cognitive Relax [0-100]	Cognitively indicates that the subject is in a state of relaxation and willingness to interact effectively with the environment. If disabled, it generates a state of inhibition hindering the process of decision making.			



Visual Attention – Hotspot: the points in red are the ones that have a higher visual concentration, while those ones in green indicate less attractive areas.



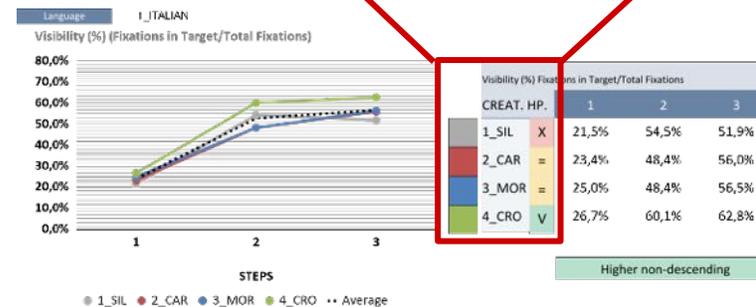
AOI – Area of Interest: is a defined area of the stimulus in which we measure the percentage of participants who saw it and the perceptual-cognitive reactions of the sample.

EEG and Eye Tracking - Three phases Synthesis

	Metrics	Criteria for synthesizing three steps into a single evaluation
Eye-Tracking	Participants (N)	X A Creativity is considered unacceptable when at least in one step the number of participants is below the relevant threshold. The thresholds are based on previous research benchmarks. (Step 1, 60%; Step 2, 80%; Step 3, 90%)
		V A Creativity is acceptable when no value of the three steps is below the corresponding threshold.
	Visibility FixTarget/FixTot (%)	X A Creativity is considered unacceptable when at least one visibility value is lower than the value of the previous step.
		V The Visibility of a Creativity is good when it is higher than the average value at least in the second and third step.
		= A Creativity is considered fair when it is not descending, but remains below the average value along the three steps.
	Fixations Duration (ms)	X A Creativity is considered unacceptable when in at least one of the three steps the average fixation time is less than 200ms. or more than 500ms.
V A Creativity is acceptable when its average fixation time is always between 200ms. and 500ms.		
EEG	= A Creativity is considered fair: if the values of the same indicator measured over all the steps are simultaneously active, non-active and in routine; if the second and the third steps are in routine; if the first two steps are active and the third is not active; if the first two steps are non-active and the third active.	
	V A Creativity is considered good when: the last step is active unless it is preceded by two non-active steps; if the last step is in routine and the second one is active.	
	X A Creativity is considered unacceptable when: the last step is non-active, unless it is preceded by two active steps; if the last step is in routine and the second one is non active.	

Table Example:

	Visibility (%) Fixations	CREAT. HP.
1_SIL	X	
2_CAR	=	
3_MOR	=	
4_CRO	V	



Content Analysis structure

- The results of the analysis will be displayed by evaluating the different creativity for each language.
- Visibility and EEG reactions for the three approach plans will be evaluated.
- The results of the fourth phase will be integrated as a complementary way.
- Then results will be summarized for each creativity for each language in order to have an overall point of view of perceptive performance.
- The analysis will then be enriched with information from rational interviews carried out after the vision of creativity.
- At the end of the analysis, changes to the creativities will be proposed in order to improve their performance.

Creative Hypotheses - Italian Language



1 Silhouette



2 Car

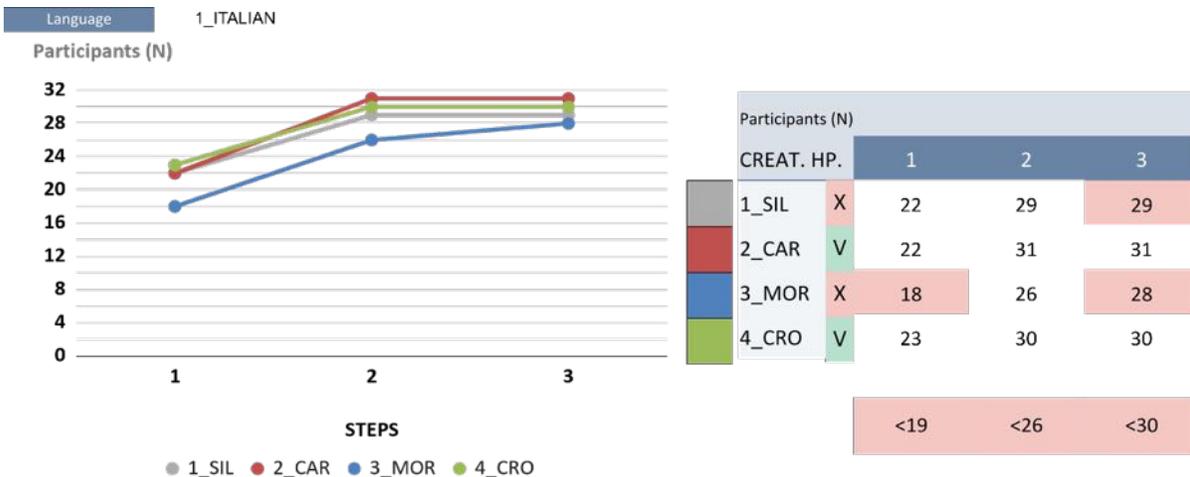


3 Morgue

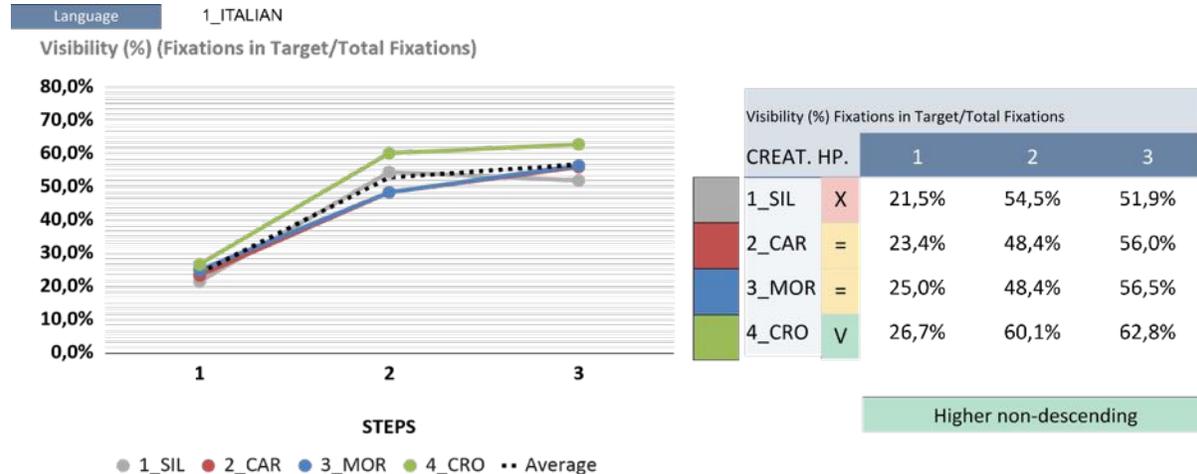


4 Crossing

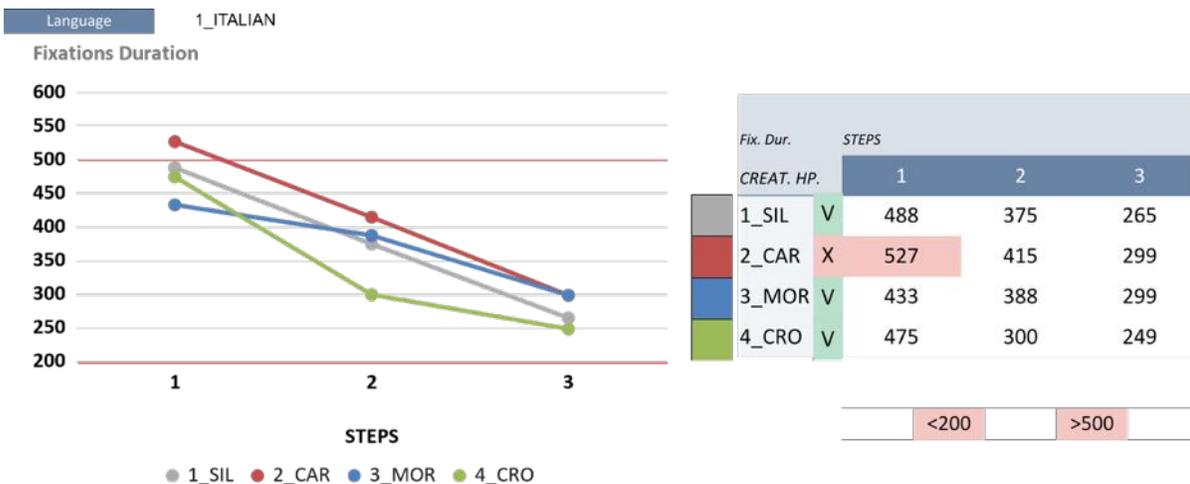
Eye-tracking analysis - Italian language



Car and Crossing Creative Hypotheses are acceptable because they are seen by almost the whole sample. Silhouette and Morgue Creative Hypotheses don't reach a sufficient number of Participants, so they are considered unacceptable.



Only the Crossing Creative Hypothesis reaches a good level of visibility, in fact, compared to the others, the metric is higher and non-descending. Silhouette Creativity is considered unacceptable because the value of the third step is lower than the second one.



The Car Creative Hypothesis is the worse (in the first step it's higher than 500 ms.), so it's unacceptable; while Crossing, Silhouette and Morgue Creative Hypotheses are acceptable.

Eye-tracking analysis - 1_Silhouette Italian

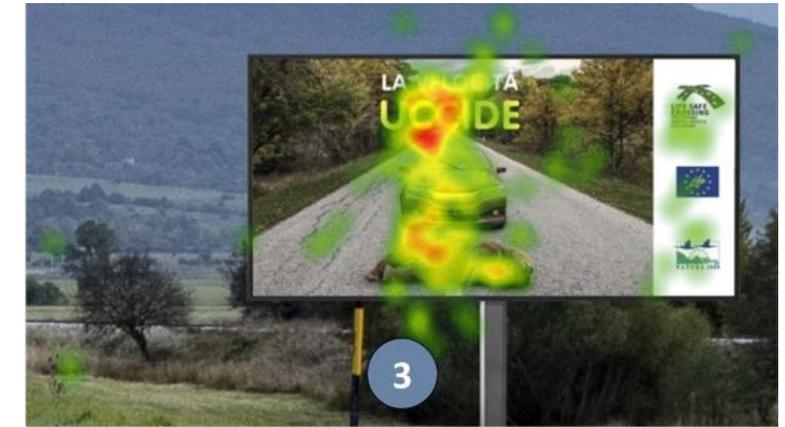
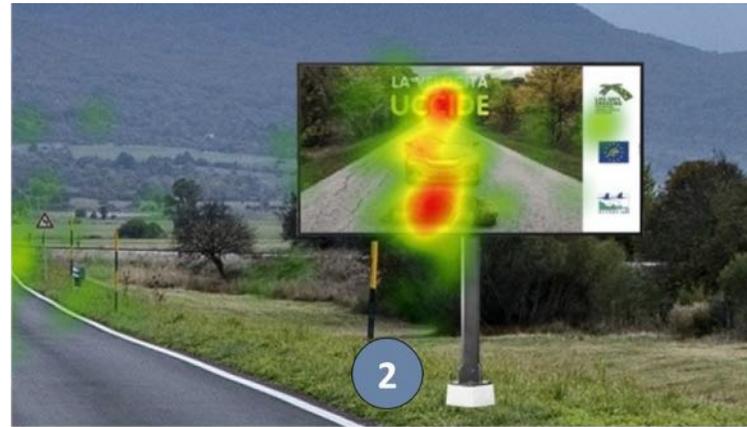
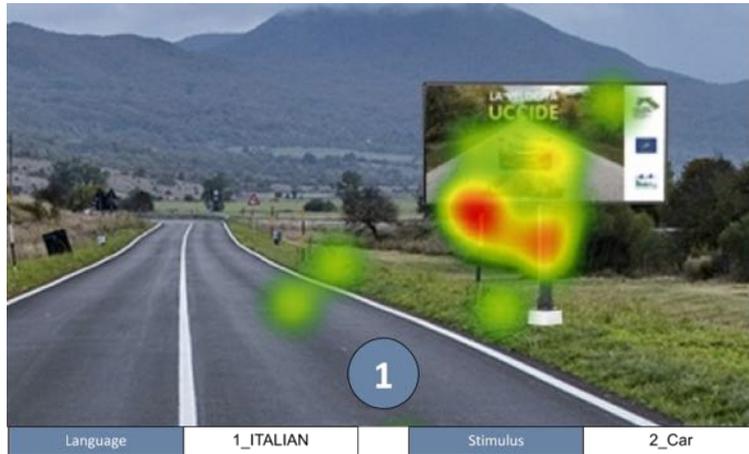


Silhouette Creativity has visibility issues; it can't reach full audience and can't keep participants' interest in the target area (visibility decreases in the third step).

The main figure (bear chalk outline) is not enough visible (just a little bit from afar). The main and only gaze point is on the second line of the claim ("Lasci il segno"). The main message "Rallenta" is barely seen. In the third step the sample begins to observe the bear's snout and braking marks.

Moreover, project logos are not seen.

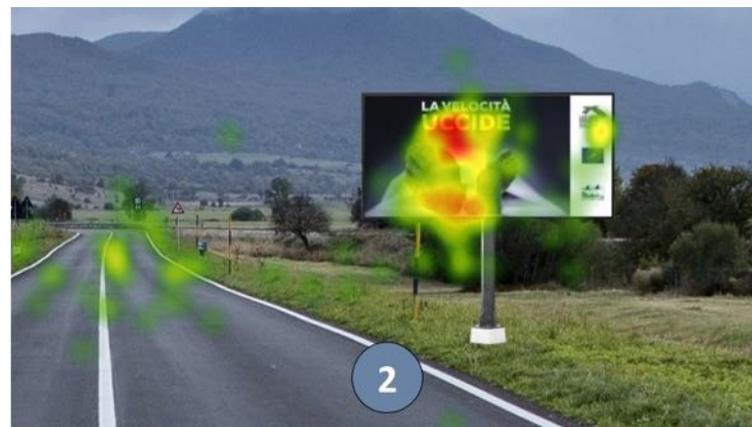
Eye-tracking analysis - 2_Car Italian



Car Creative Hypothesis is seen by more participants because it can generate more points of attention observable from a distance.

Moreover the visual attractivity (fixations in target rate) is correct. The fixing time is high at the first approach phase because an effort is detected to distinguish the objects present in it. The project logos are hardly seen. The claim message “La velocità uccide” is readable.

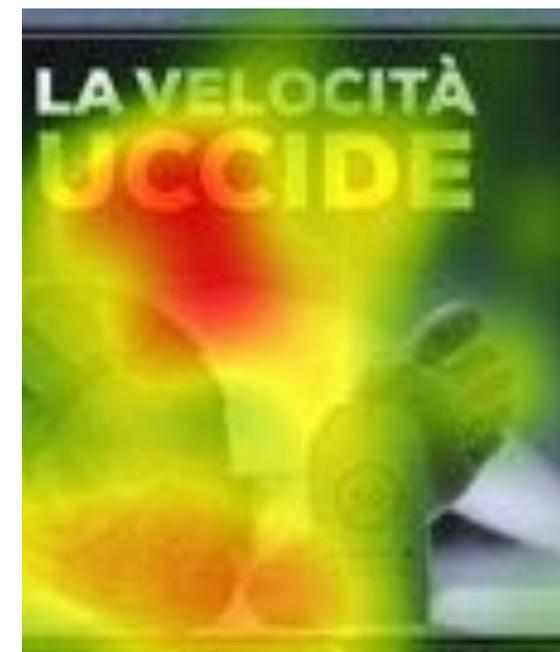
Eye-tracking analysis - 3_Morgue Italian



Morgue Creative Hypothesis has a visibility issue related to the number of participants that have seen the communication in the first and the last approach phase.

Visual attractiveness and effort are in routine. In the first two steps, there is a strong gaze point in the white triangle formed between the two feet that can mislead vision from far.

In addition, only the first logo is seen.



Eye-tracking analysis - 4_Crossing Italian

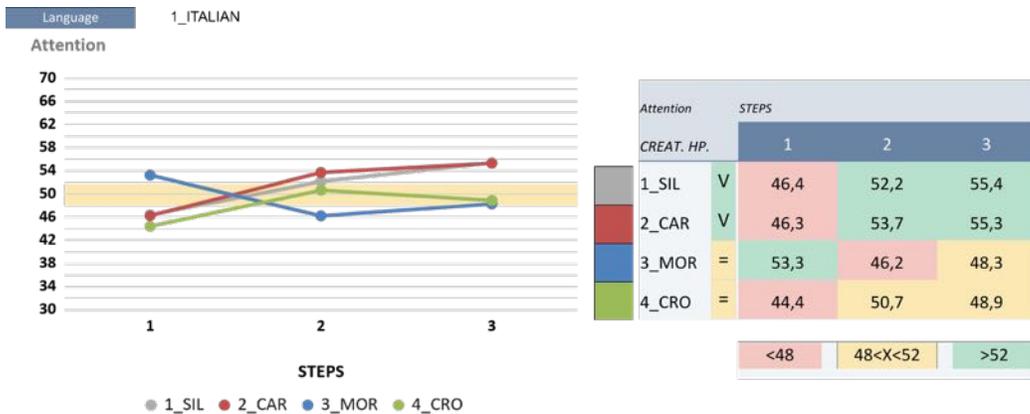


Crossing Creative Hypothesis has the best visual performance. It is able to attract the sample by generating more points of attention, especially in the third approach phase. From a distance, the visual is immediately identified in its most important detail: "the puppy".

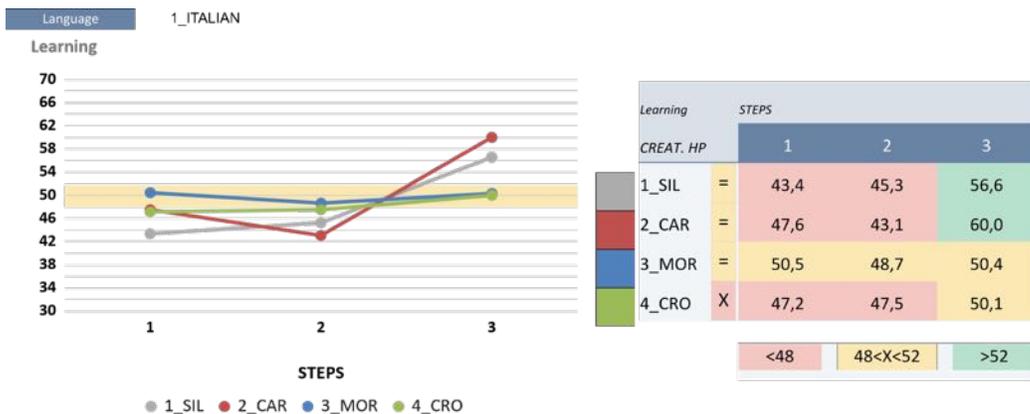
Logos are also explored more.

The contrast between the visual and the street helps to identify the subject. The uniform background underneath the claim makes it easier to read. The main message "Slow down" was well watched.

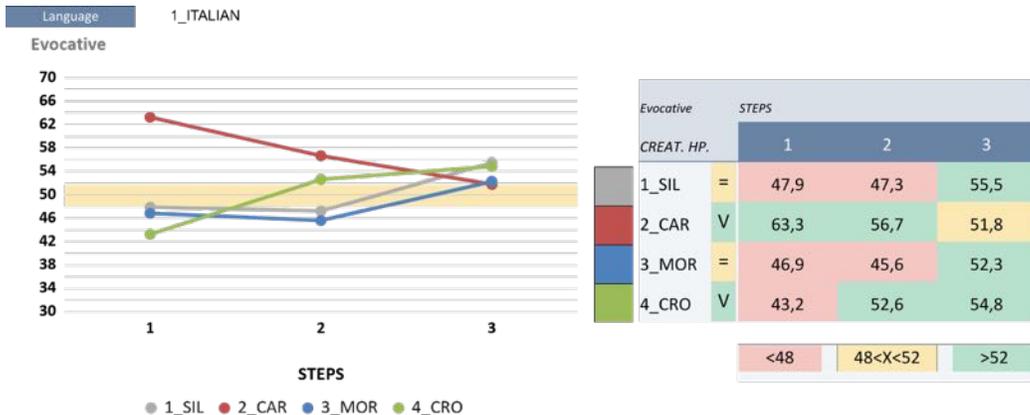
EEG - Reaction - Italian language



The graph and the table represent, in the Italian group, the EEG Attention metric for each Creative Hypothesis. The Attention is good only in the Creative Hypotheses Silhouette and Car where the metric is active in the approach phases 2 and 3. In the others Creative Hypotheses the Attention reach a medium level and it's considered fair.

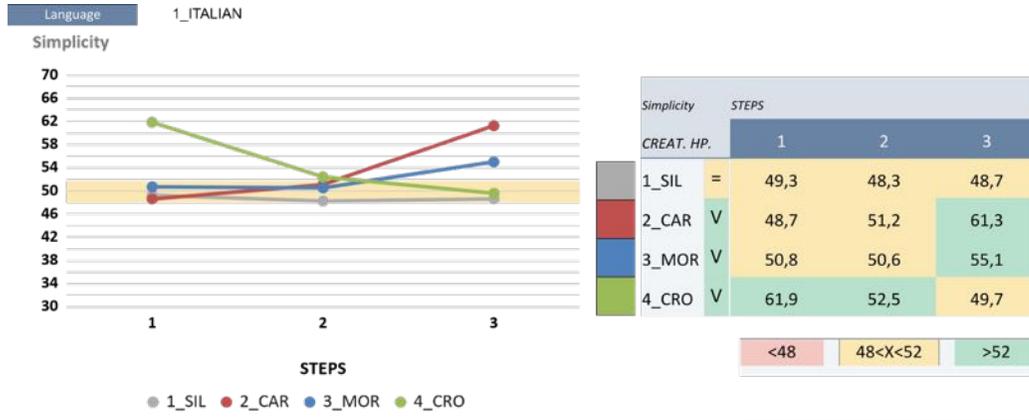


The graph and the table represent, in the Italian group, the EEG Learning metric for each Creative Hypothesis. The Learning metric is considered fair in the Silhouette, Car and Morgue Creative Hypotheses. The Crossing Creative Hypothesis is unacceptable because Learning is too low (routine state reached only in step 3).

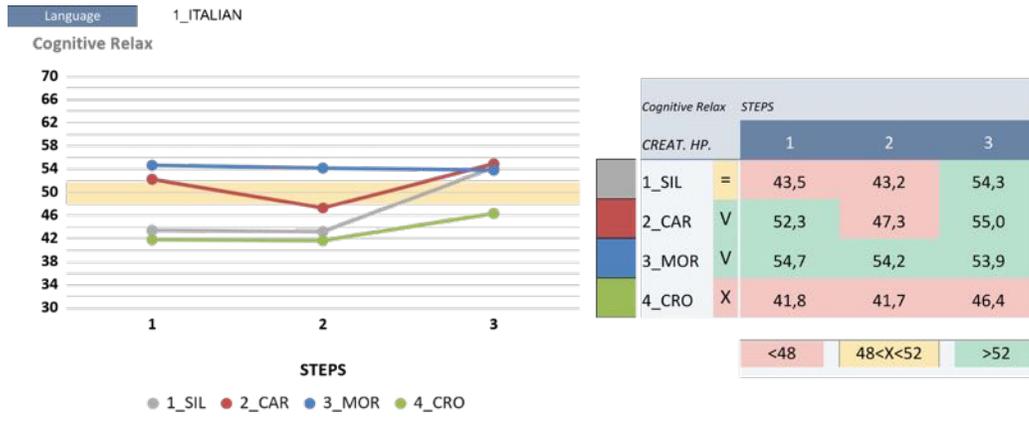


The graph and the table represent, in the Italian group, the Evocative EEG metric for each Creative Hypothesis. The Evocative metric is good in the Car and Crossing Creative Hypotheses where the metric is active in two approach phases. In the Silhouette and Morgue Creative Hypotheses the Evocative metric is activated only in the third approach phases, before is deactivated, so it's considered fair.

EEG - Reaction - Italian language



The graph and the table represent, in the Italian group, the EEG Simplicity metric for each Creative Hypothesis. The Simplicity metric is good in all the Creative Hypotheses except for the Silhouette one where the metric is fair.



The graph and the table represent, in the Italian group, the EEG Cognitive Relax metric for each Creative Hypothesis. The Cognitive Relax metric is good in the Car and Morgue Creative Hypotheses where the metric is active in at least two approach phases. In the Silhouette Creative Hypothesis the metric is considered fair while in the Crossing one is unacceptable because it's always deactivated.

2_Car Creativity Eye-tracking and EEG Analysis - Italian Language



Car Creative Hypothesis reaches the best EEG reaction from the sample. The scene communicates correctly since at the third step the indicators are almost all active even if it has some problems in the second approach phase.

This means that it can be improved by making the objects more recognizable: the evocative drops very quickly together with the Cognitive Relax metric.

The bear's snout must be more marked and the car damage more recognizable. In the fourth step, those elements that need further investigation are observed.

Let's observe the Hotspot and AOI for Car Creative Hypothesis in the Italian language in the fourth approach phase and let's analyze the EEG results in the AOIs.

Participants, according to 4th approach phase Hotspots, need to deepen the details of the objects because they have not been able to do so before. In this way they can learn the details (high Learning). The other parts of the communication are not observed by many participants.

1_ITA

CREAT. HP.	AOI	Attention	Learning	Evocative	Simplicity	Cognitive Relax	Participants	Fix. Dur.
2_CAR	01_TEXT1	41,8	41,3	60,8	54,7	51,4	8	170
	02_TEXT2	36,1	44,0	45,4	48,3	48,8	15	225
	03_VISUA	47,5	52,4	47,9	50,5	53,9	31	253
	04_LOGO1	36,6	52,7	48,6	45,6	58,8	10	215
	05_LOGO2	49,0	75,4	41,1	56,3	72,3	4	183
	06_LOGO3	75,6	64,8	64,9	20,2	48,8	1	233

4_Crossing Creativity Eye-tracking and EEG Analysis - Italian Language



Crossing Creative Hypothesis has the ability to make the Evocative grow more than the others and thus connect participants with the content. Simplicity confirms that no cognitive efforts are present and also that the composition is well visible from a distance and closely understandable. In spite of its recognizability, it is not able to capture the attention and it doesn't revive Learning: in essence it doesn't create any novelty effect. Cognitive Relax metric confirms that the scene has to be better contextualized: the bear could look directly into the camera showing that he is realizing the imminent collision.

Let's observe the Hotspot and AOI for Crossing Creative Hypothesis in the Italian language in the fourth approach phase and let's analyze the EEG results in the AOIs.

The Hotspot of the 4th approach phase indicates that participants want to look at the visual, especially the puppy's face, which is not so visible from a distance. 20 Participants read the second part of the message, without focusing on any specific point. Even in this creativity, the upper part of the writing is less seen.

1_ITA

CREAT. HP.	AOI	Attention	Learning	Evocative	Simplicity	Cognitive Relax	Participants	Fix. Dur.
1_SIL	01_TEXT1	41,8	32,7	41,8	49,1	33,8	14	190
	02_TEXT2	54,1	56,2	50,6	49,5	56,8	21	210
	03_VISUA	55,8	46,6	55,3	47,9	47,7	25	243
	04_LOGO1	51,6	53,4	49,7	55,7	53,3	11	298
	05_LOGO2	51,8	49,5	47,0	45,2	41,1	3	161
	06_LOGO3	36,4	52,9	46,9	51,5	60,9	5	266

1_Silhouette Creativity Eye-tracking and EEG Analysis - Italian Language



Silhouette Creative Hypothesis generates a medium reaction from the sample who observed the creativity. The main problem is observed on the Simplicity that fails to activate unlike other communications. This confirms that the visual and the writing are not so simple to observe. Billboards must be simple because they are observed in motion.

Let's observe the Hotspot and AOI for Silhouette Creative Hypothesis in the Italian language in the fourth approach phase and let's analyze the EEG results in the AOIs.

In fact in the 4th approach phase participants are focused in the 02_TEXT area and in the chalk outline. They need to deepen "Lasci il segno" (high Attention and Learning) and the Visual (high Attention and Evocative): this means they are recalling the form to the represented object. The Hotspot representation show us that the tire skid are not observed.

1_ITA

CREAT. HP.	AOI	Attention	Learning	Evocative	Simplicity	Cognitive Relax	Participants	Fix. Dur.
1_SIL	01_TEXT1	41,8	32,7	41,8	49,1	33,8	14	190
	02_TEXT2	54,1	56,2	50,6	49,5	56,8	21	210
	03_VISUA	55,8	46,6	55,3	47,9	47,7	25	243
	04_LOGO1	51,6	53,4	49,7	55,7	53,3	11	298
	05_LOGO2	51,8	49,5	47,0	45,2	41,1	3	161
	06_LOGO3	36,4	52,9	46,9	51,5	60,9	5	266

3_Morgue Creativity Eye-tracking and EEG Analysis - Italian Language



Morgue Creative Hypothesis doesn't generate a good result. Although it captures Attention from a distance it can't keep it high, probably due to the dark color of the background and therefore contrasted with the environment. Simplicity and Cognitive Relax metrics remain at good levels and this indicates no particular perceptual obstruction. Learning is always in a routine state, and Evocative is only activated at the last approach phase after being deactivated in the first two. This means that the scene has to be more attractive from a distance by illuminating, for example, the foot and paw better.

Let's observe the Hotspot and AOI for Morgue Creative Hypothesis in the Italian language in the fourth approach phase and let's analyze the EEG results in the AOIs.

All visual attention is focused on reading the label hanging on the foot. In the approach phases 1-3 the participants did not have the opportunity to read it. The message contained in the tag in the first 3 steps was not perceived. The texts are well perceived by the subjects who reread them at this point.

1_ITA

CREAT. HP.	AOI	Attention	Learning	Evocative	Simplicity	Cognitive Relax	Participants	Fix. Dur.
3_MOR	01_TEXT1	63,6	50,5	39,9	52,1	57,1	7	190
	02_TEXT2	62,6	57,8	51,2	52,8	55,5	16	175
	03_VISUA	54,5	57,6	47,8	57,4	56,3	30	307
	04_LOGO1	40,4	55,6	43,7	58,4	51,5	9	265
	05_LOGO2	43,0	40,4	33,8	55,5	34,5	5	139
	06_LOGO3	59,8	64,2	66,3	80,7	43,4	3	190

Summary - Italian Language

Language 1_ITALIAN



1_ITALIAN	1_Silhouette	2_Car	3_Morgue	4_Crossing
Participants	X	V	X	V
Visibility FixTarget/FixTot	X	=	=	V
Fixations Duration	V	X	V	V
Attention	V	V	=	=
Learning	=	=	=	X
Evocative	=	V	=	V
Simplicity	=	V	V	V
Cognitive Relax	=	V	V	X

The green frame highlights the best Creative Hypothesis, the yellow one the second.

Car Creative Hypothesis is the best because it reaches a good cognitive performance (EEG metrics) and a sufficient visual performance (Eye-tracking metrics).

Crossing Creative Hypothesis is the second classified because it has a good visual performance (Eye-tracking metrics) and a sufficient cognitive performance (EEG metrics).

Creative Hypotheses - Greek Language



1

Silhouette



2

Car



3

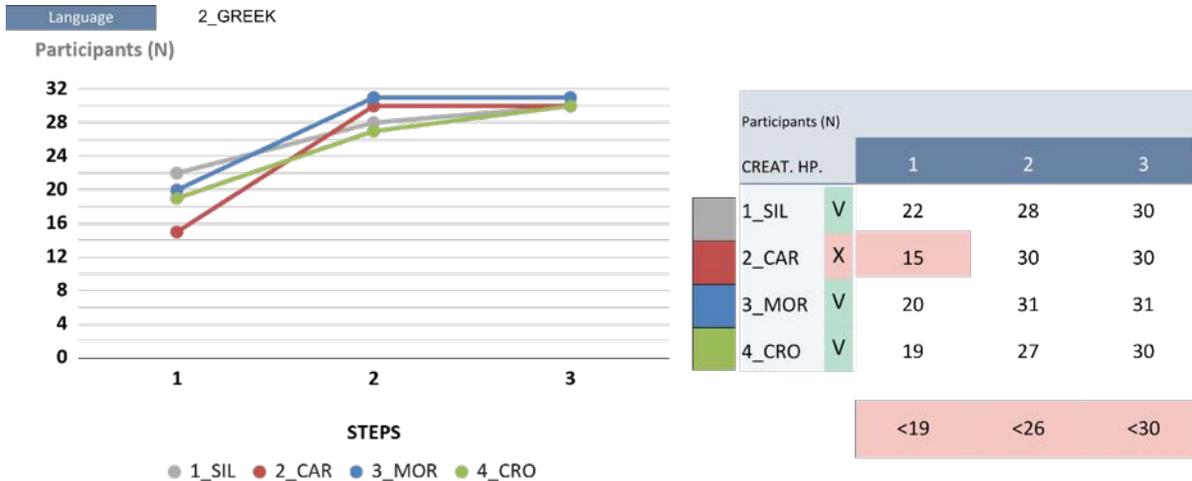
Morgue



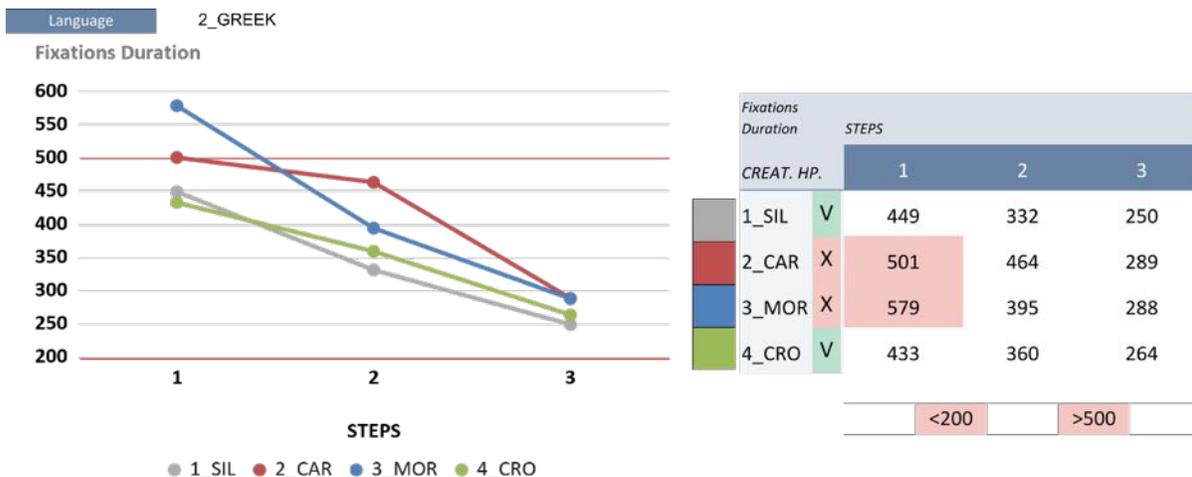
4

Crossing

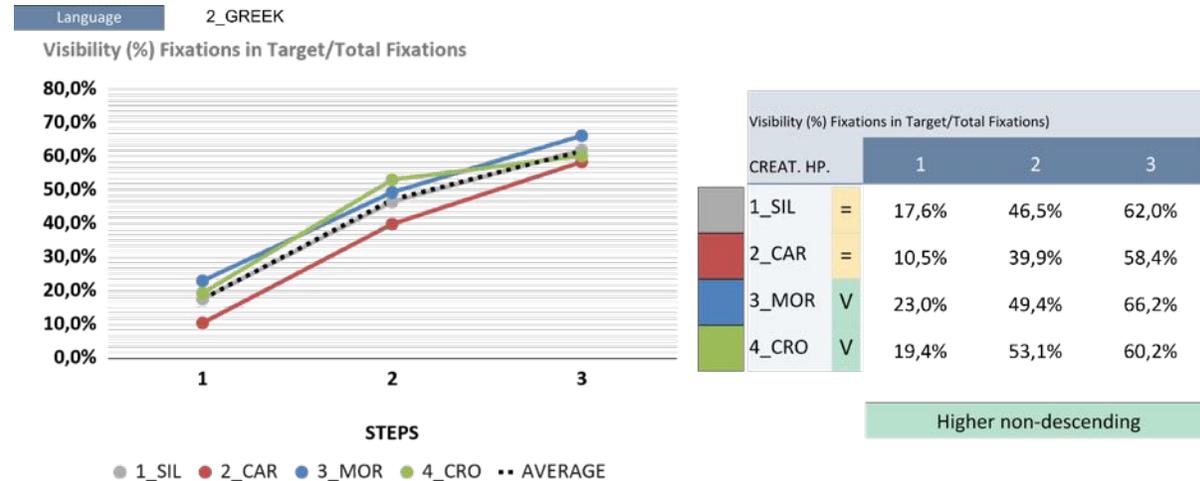
Eye-tracking analysis - Greek language



Silhouette, Morgue and Crossing Creative Hypotheses reach the best Participants Number, so they are seen by almost the whole sample and are acceptable. At the first approach phase the Participants Number of the Car Creative Hypothesis is too much lower, so it is unacceptable.



The Morgue and Car Creative Hypotheses are the worse (in the first approach phase it's higher than 500 ms.) so they're unacceptable, while Silhouette and Crossing are acceptable.



Morgue and Crossing Creative Hypotheses reach a good level of Visibility (the metric is higher and non-descending), while Silhouette and Car Creative Hypotheses are considered fair.

Eye-tracking analysis - 1_Silhouette Greek



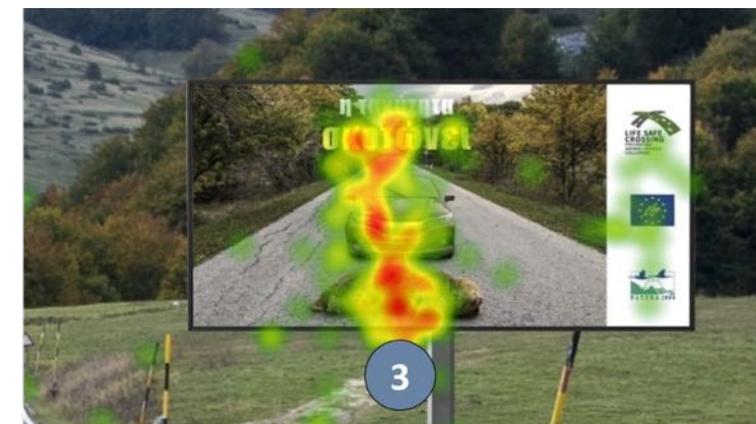
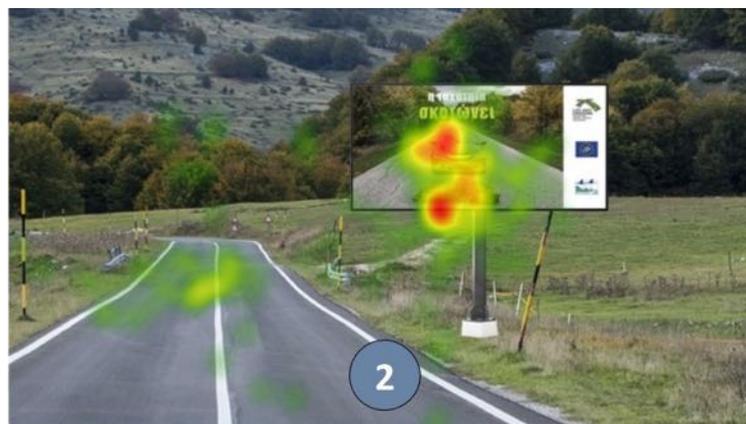
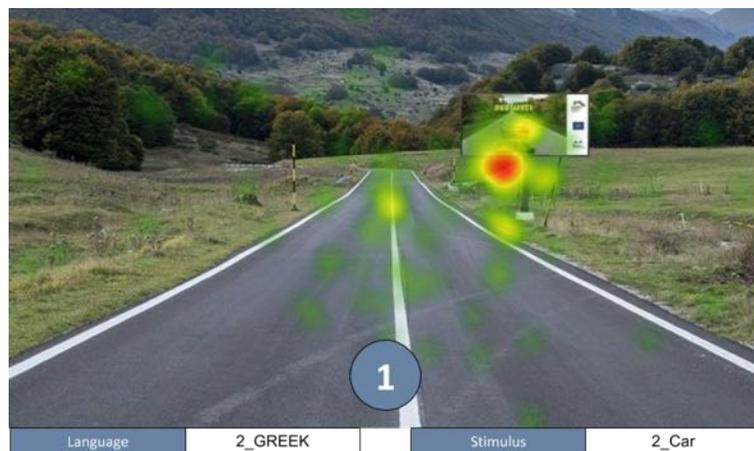
In the Silhouette Creative Hypothesis the visibility is very good. It captures the view of the participants, at the right time and with the right attractiveness.

The text that occupies the entire width horizontally allows the participants to better perceive the chalk outline snout.

It is easy to observe in the hotspot of the second and third approach phase.

The tracks left by the tyres are also observed.

Eye-tracking analysis - 2_Car Greek



Car Creativity is not able to attract from afar.

If the texts had been larger the barycenter of vision would have risen, increasing the probability of being observed from afar.

In the second step the inscription is not observed.

In the third step the car is observed correctly, particularly where it shows signs of an accident.

Eye-tracking analysis - 3_Morgue Greek



Morgue Creativity manages to capture the sample's gaze and be the most visually attractive in the three steps.

It has a problem of fixation time from a distance because the claim is smaller and the center of gravity is lowered and the shape of the V-shaped feet take the look out of the billboard.

Eye-tracking analysis - 4_Crossing Greek

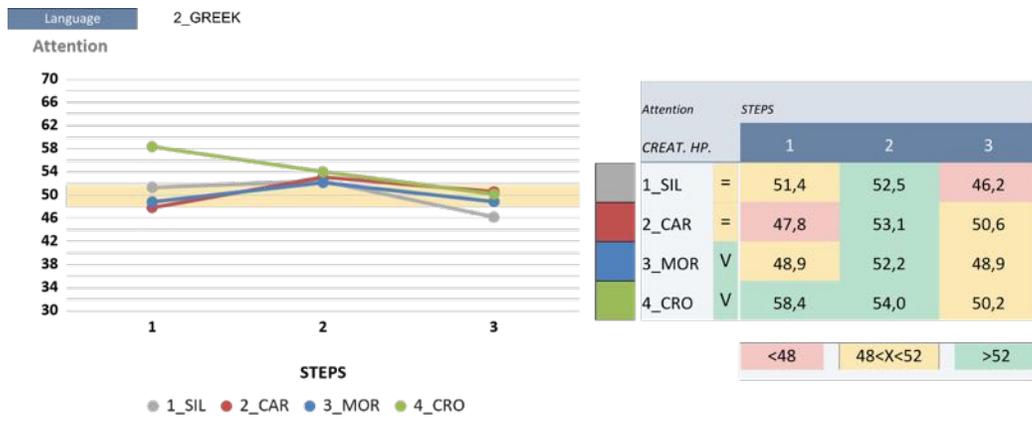


Crossing Creative Hypothesis has a good visibility performance.

Visibility and Fixations time are good because the main figure is easy to identify: the image is contrasted and with a lot of fixation points.

In the first approach phase there is border value number of participants: this is due to the difficult recognition of the bear cub.

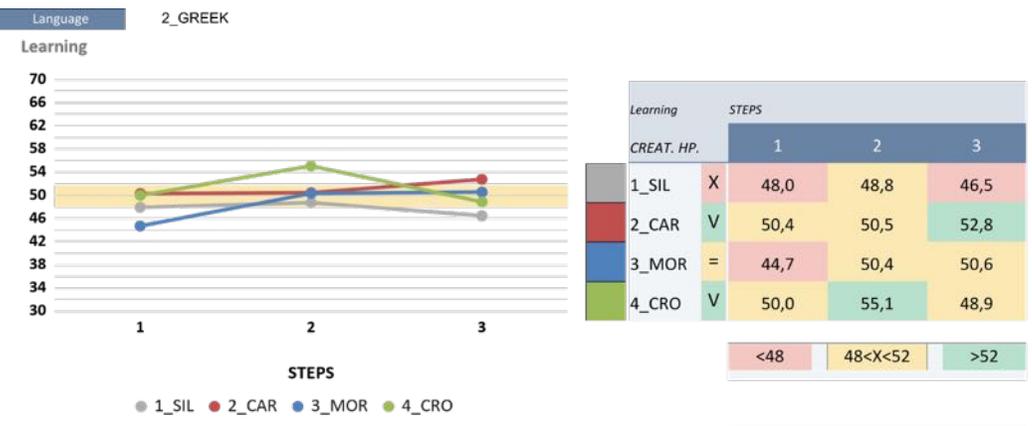
EEG - Reaction - Greek language



The graph and the table represent, in the Greek group, the EEG Attention metric for each Creative Hypothesis.

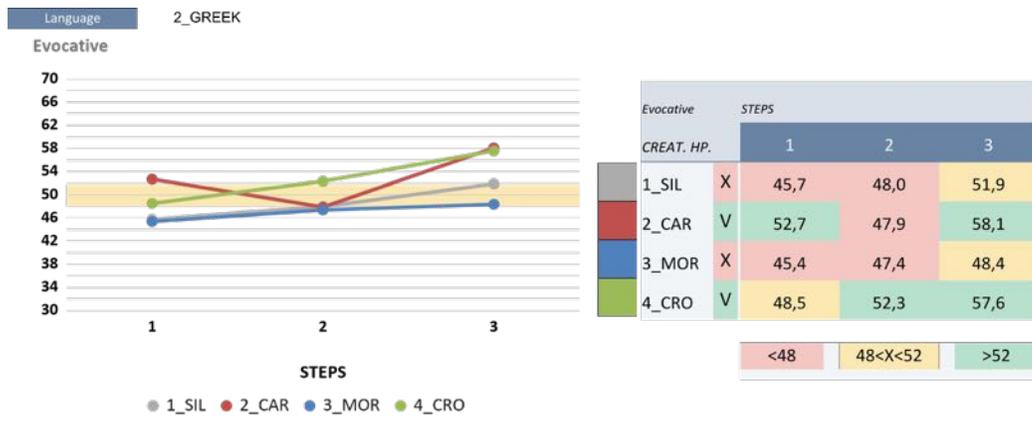
The Attention is good only in Crossing and Morgue Creative Hypothesis.

The other Creative Hypotheses are fair.



The graph and the table represent, in the Greek group, the EEG Learning metric for each Creative Hypothesis.

The Learning is good only in Car and Crossing Creative Hypotheses where the metric is active in at least one approach step and in the other steps is in routine. The Creative Hypothesis Morgue is fair and the Silhouette one isn't acceptable because it's too low.



The graph and the table represent, in the Greek group, the Evocative EEG metric for each Creative Hypothesis.

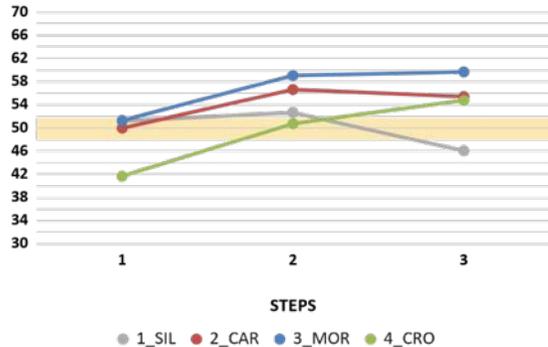
The Evocative metric is good only in the Car and Crossing Creative Hypotheses where the metric is active in two approach phases.

The Silhouette and Morgue Creative Hypotheses are unacceptable because the Evocative metric is too low.

EEG - Reaction - Greek language

Language 2_GREEK

Simplicity



		STEPS		
Simplicity		1	2	3
CREAT. HP.				
1_SIL	=	51,3	52,7	46,1
2_CAR	V	50,0	56,7	55,5
3_MOR	V	51,3	59,1	59,7
4_CRO	=	41,7	50,8	54,8

<48 48<X<52 >52

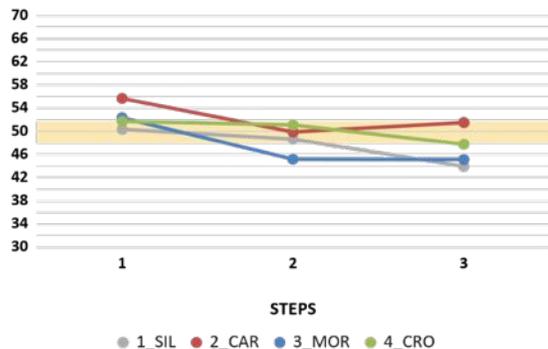
The graph and the table represent, in the Greek group, the EEG Simplicity metric for each Creative Hypothesis.

The Simplicity metric is acceptable only in the Car and Morgue Creative Hypotheses because it's active in two approach phases.

The Crossing and Silhouette Creative Hypotheses are fair because Simplicity metric reaches an average level.

Language 2_GREEK

Cognitive Relax



		STEPS		
Cognitive Relax		1	2	3
CREAT. HP.				
1_SIL	X	50,4	48,7	44,0
2_CAR	=	55,7	49,9	51,6
3_MOR	X	52,4	45,2	45,2
4_CRO	X	51,8	51,2	47,8

<48 48<X<52 >52

The graph and the table represent, in the Greek group, the EEG Cognitive Relax metric for each Creative Hypothesis.

All the Creative Hypotheses are unacceptable, except for the Car one which is fair in fact Cognitive Relax metric is active in the first approach phase and then in routine.

4_Crossing Creativity Eye-tracking and EEG Analysis - Greek Language



Crossing Creative Hypothesis has the best performance.

The attention is high from the first step, there is a strong moment of Learning already from the second approach phase and the Evocative growing throughout the period.

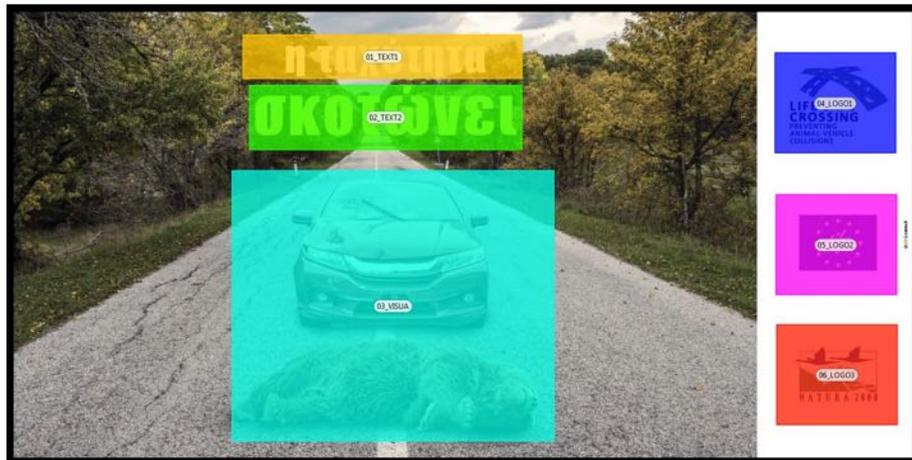
We noticed a problem of cognitive effort at the first step that can be solved by improving the identification of the bear cub.

Cognitive Relax too low indicates that the scene needs to be further contextualized: this is confirmed by the hotspot of the fourth step which focuses the visual attention to the adult bear's face since the first three steps have not yet been related to the cub.

2_GRE

CREAT. HP.	AOI	Attention	Learning	Evocative	Simplicity	Cognitive Relax	Participant	FixDur
4_CRO	01_TEXT1	49,7	51,3	63,0	41,7	60,1	15	218
	02_TEXT2	56,2	47,6	55,4	47,8	50,3	25	203
	03_VISUA	46,5	38,4	51,3	39,6	49,9	27	220
	04_LOGO1	53,2	48,8	49,6	52,4	42,5	15	218
	05_LOGO2	46,8	42,9	55,7	44,9	42,4	9	223
	06_LOGO3	56,1	58,0	72,5	46,0	53,5	6	263

2_Car Creativity Eye-tracking and EEG Analysis - Greek Language



Car Creative Hypothesis gets a good performance.

Visually it has problems from a distance and doesn't get very high visual attention, but the EEG reaction is very good: low Attention from a distance confirms the vision problems, but the other indicators confirm the effectiveness of the content.

In this creativity you can improve the performance by better marking the details of the accident as indicated by the hotspot of the fourth step since the participants go to look for the marks on the car and the bear's face.

2_GRE

CREAT. HP.	AOI	Attention	Learning	Evocative	Simplicity	Cognitive Relax	Participant	FixDur
2_CAR	01_TEXT1	50,4	59,3	60,3	65,9	58,7	8	199
	02_TEXT2	52,9	55,2	58,2	65,1	43,5	17	246
	03_VISUA	44,6	47,4	47,4	55,2	47,6	28	268
	04_LOGO1	43,6	54,5	58,6	54,8	62,6	10	250
	05_LOGO2	33,0	46,9	46,6	59,5	62,0	7	222
	06_LOGO3	41,6	51,0	50,6	62,6	51,4	5	197

3_Morgue Creativity Eye-tracking and EEG Analysis - Greek Language



Although Morgue Creative Hypothesis has a good visual performance, the EEG reaction remains low to medium. The only active indicator is Simplicity, but the fourth step hotspot confirm that communication details have not been observed during the first three steps. In general this creativity does not perform well.

2_GRE

CREAT. HP.	AOI	Attention	Learning	Evocative	Simplicity	Cognitive Relax	Participant	FixDur
3_MOR	01_TEXT1	56,0	61,6	71,6	66,2	40,7	5	326
	02_TEXT2	50,9	50,2	53,6	54,4	42,8	21	217
	03_VISUA	42,3	45,6	47,1	55,7	43,1	28	264
	04_LOGO1	35,7	56,2	58,6	47,0	61,4	12	253
	05_LOGO2	31,9	21,0	58,2	67,0	17,9	4	190
	06_LOGO3	33,2	56,2	57,0	67,6	51,7	3	242

1_Silhouette Creativity Eye-tracking and EEG Analysis - Greek Language



Although Silhouette Creative Hypothesis has a very good visual performance and all elements have been well observed, the EEG reaction is very bad.

It can only activate Attention in the second step, but Learning and Evocative are deactivated.

The fourth step hotspot confirms that the bear's silhouette and braking had already been seen first and the sample explores further.

2_GRE

CREAT. HP.	AOI	Attention	Learning	Evocative	Simplicity	Cognitive Relax	Participant	FixDur
1_SIL	01_TEXT1	53,4	62,4	45,9	62,2	54,6	16	181
	02_TEXT2	52,8	48,9	46,3	47,5	48,8	24	232
	03_VISUA	46,0	46,1	47,3	52,4	44,0	20	260
	04_LOGO1	49,2	46,4	50,4	38,5	47,1	14	287
	05_LOGO2	42,8	59,8	43,7	36,7	63,7	8	171
	06_LOGO3	20,2	40,3	18,8	61,8	28,6	4	272

Summary - Greek Language

Language 2_GREEK



2_GREEK	1_Silhouette	2_Car	3_Morgue	4_Crossing
Participants	V	X	V	V
Visibility FixTarget/FixTot	=	=	V	V
Fixations Duration	V	X	X	V
Attention	=	=	V	V
Learning	X	V	=	V
Evocative	X	V	X	V
Simplicity	=	V	V	=
Cognitive Relax	X	=	X	X

The green frame highlights the best Creative Hypothesis, the yellow one the second. Crossing Creative Hypothesis is the best because it reaches a quite good cognitive performance (EEG metrics) and a good visual performance (Eye-tracking metrics).

Car Creative Hypothesis is the second classified because it has a good cognitive performance (EEG metrics), but the visual performance (Eye-tracking metrics) is not so good.

Creative Hypotheses - Romanian Language



1 Silhouette



2 Car

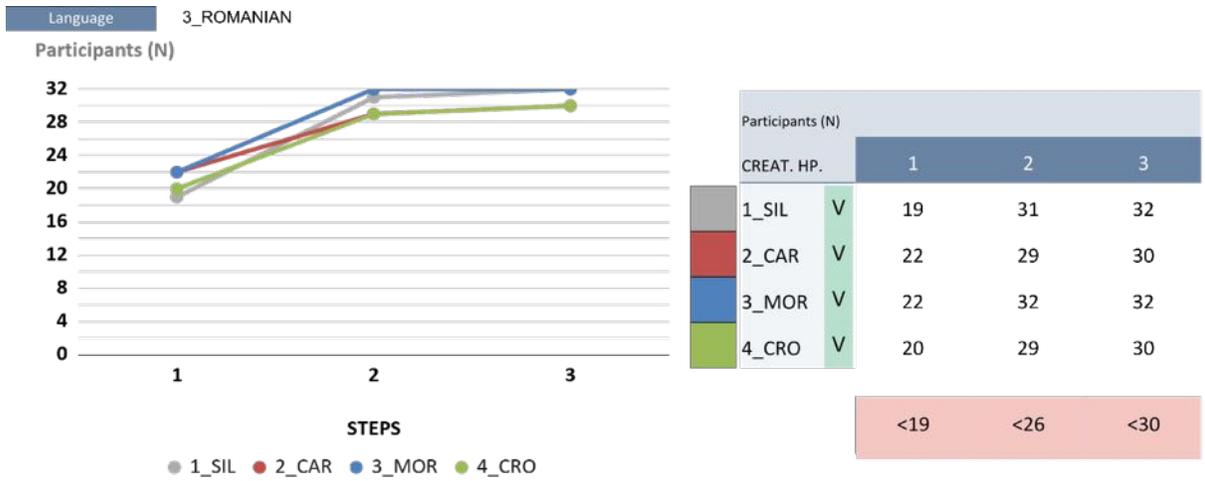


3 Morgue

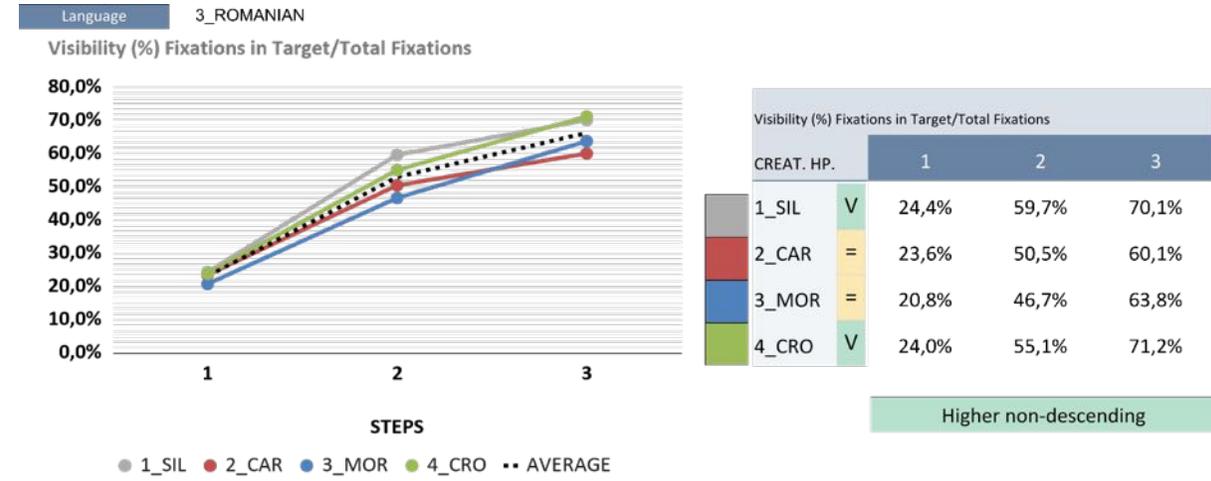


4 Crossing

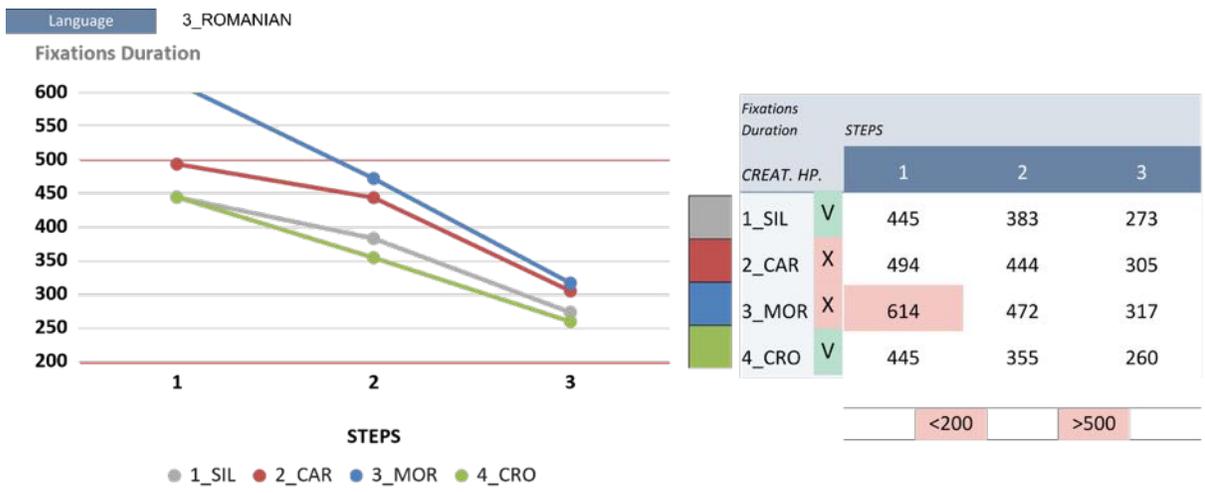
Eye-tracking analysis - Romanian language



All the Creative Hypotheses reach the best Participants Number, so they are seen by almost the whole sample and they are acceptable.



The Silhouette and Crossing Creative Hypotheses reach a good level of Visibility (the metric is higher and non-descending). The Visibility of Car and Morgue Creative Hypotheses reaches a medium level, so they are considered fair.



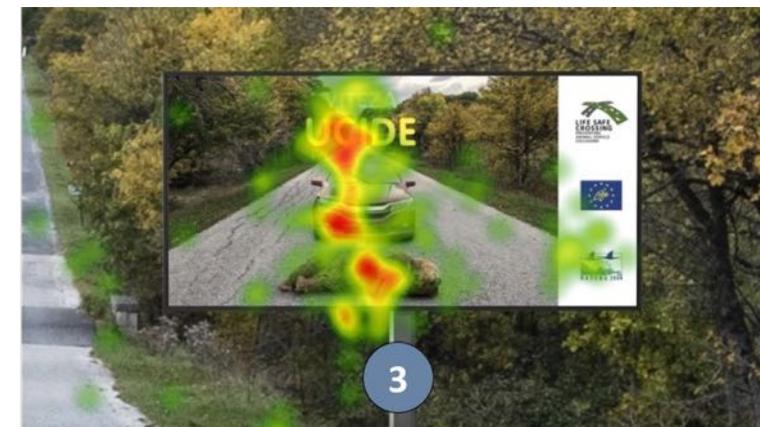
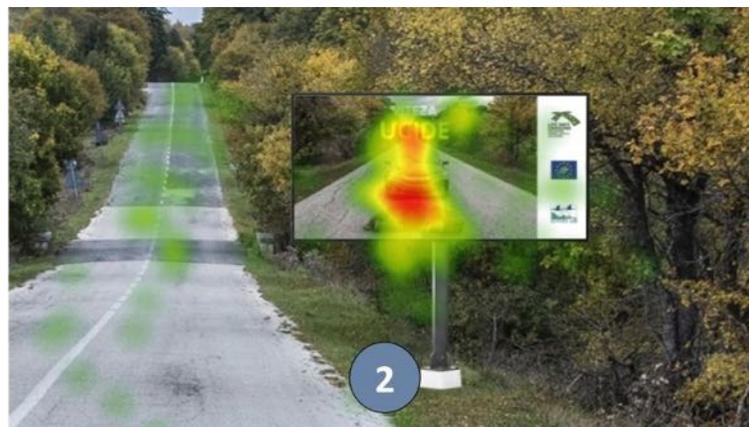
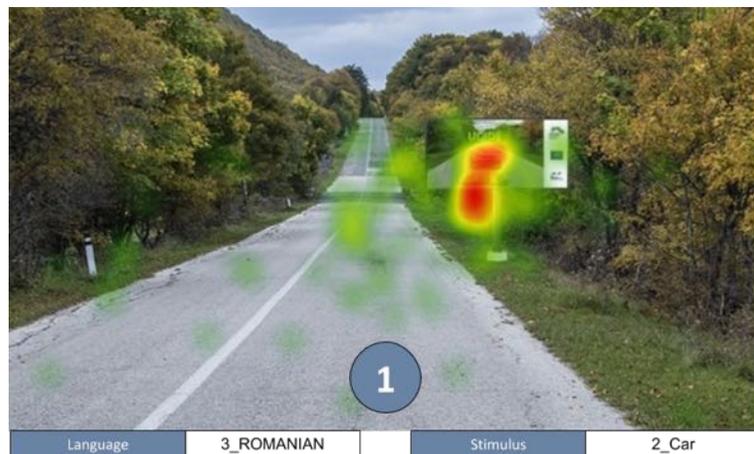
The Car and Morgue Creative Hypotheses are the worse, so they are unacceptable: in fact, in the first step Fixations Duration is higher than 500 ms. or close to 500 ms.. On the contrary, Silhouette and Crossing Creative Hypotheses are the best because they are between the effectiveness thresholds and, in the second and third approach phases, the Fixations Duration is fewer, so they are acceptable.

Eye-tracking analysis - 1_Silhouette Romanian



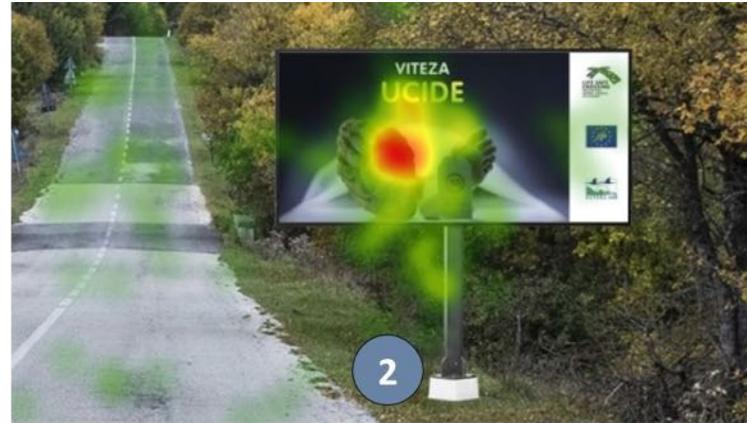
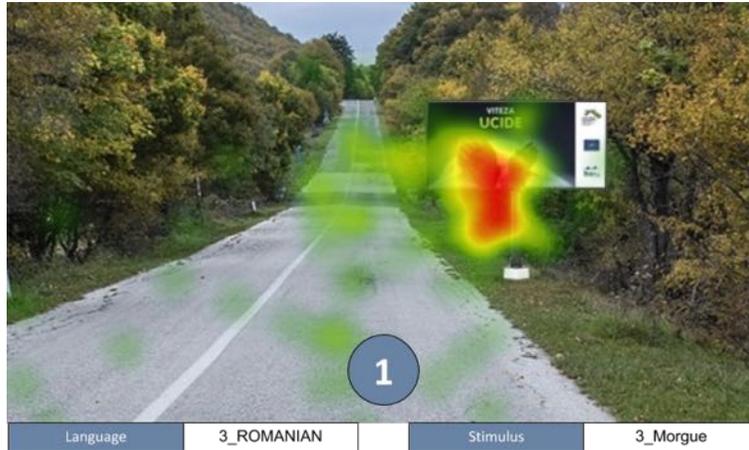
The Visibility of Silhouette creativity is excellent, considering both the number of participants reached, the percentage of attractiveness and the average fixation time. In the first step there is visual attention also on the pole that supports the billboard, but in the sequence of the three steps there is an excellent progression of vision. In fact, in the first approach phase you can see the Visual, in the second one the details of the visual (braking sign) and start reading the text, while in the third step the exploration is complete (except for the logos on the sides).

Eye-tracking analysis - 2_Car Romanian



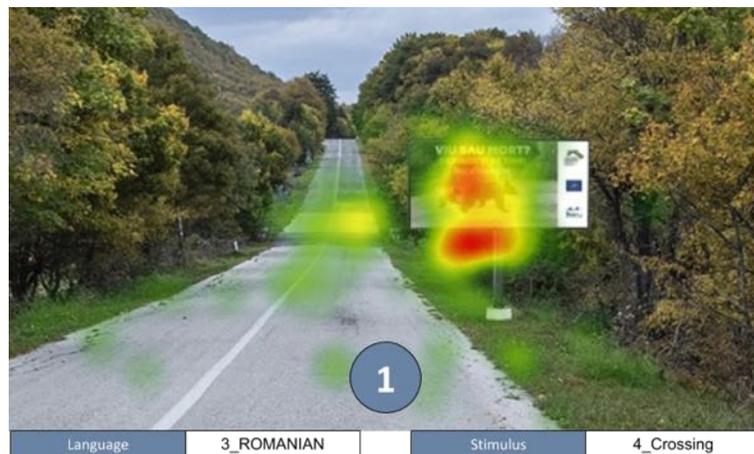
Car creativity has good visibility. It has no specific problems in any step, even if at the first step it is at the limit of 500 ms. of average fixation. This means that from a distance the represented object is not well distinguished, but we are within the limits. In the second and third step the values improve, but do not reach the performance of the others. The composition, however, seems to be explored well since the hotspots indicate a correct scan in the detail points of the bear and the car. The bear's snout was already observed in the second step.

Eye-tracking analysis - 3_Morgue Romanian



Morgue creativity has a big problem of visual effort. In the first step it exceeds by far the threshold of 500 ms. average per fixation. This means that the target is difficult to distinguish. The V shape of the feet doesn't help the scanpath here either. In the second and third step the indicators improve and from the hotspot you can see that all the details of the creativity have been observed except the message "It was going at 100 km per hour".

Eye-tracking analysis - 4_Crossing Romanian

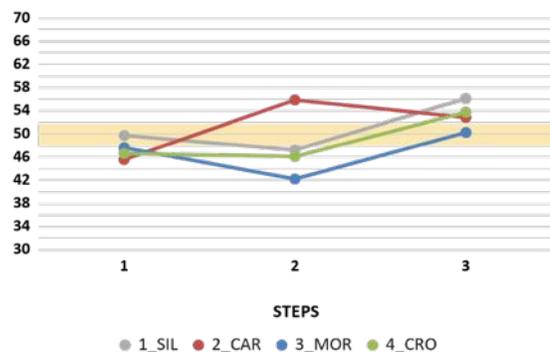


The visibility of Crossing creativity and its scanpath are excellent. From afar the whole is explored, in the second step it focuses on the bear cub's snout and starts reading the text. While the third step focuses on the text "Incetinese", "Slow down".

EEG - Reaction - Romanian language

Language 3_ROMANIAN

Attention



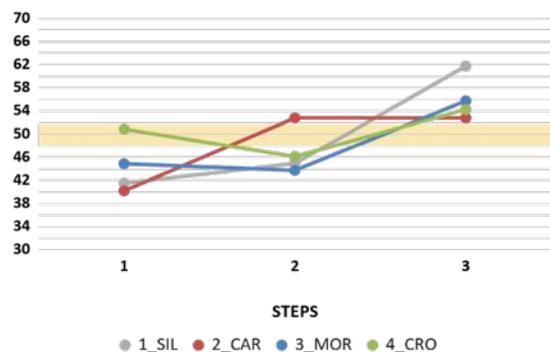
		STEPS		
CREAT. HP.		1	2	3
1_SIL	=	49,8	47,3	56,2
2_CAR	V	45,6	55,9	52,9
3_MOR	X	47,7	42,2	50,3
4_CRO	=	46,7	46,1	53,8

<48 48<X<52 >52

The graph and the table represent, in the Rumanian group, the EEG Attention metric for each Creative Hypothesis. The Attention is good only in the Car Creative Hypothesis where the metric is active in two approach phases. The Silhouette and Crossing Creative Hypotheses are considered fair, while the Morgue one isn't acceptable because it's too low.

Language 3_ROMANIAN

Learning



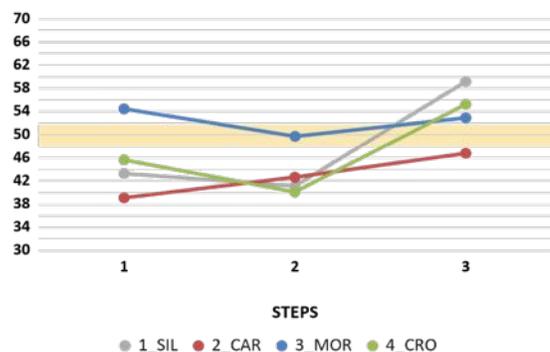
		STEPS		
CREAT. HP.		1	2	3
1_SIL	=	41,5	45,0	61,8
2_CAR	V	40,2	52,9	52,8
3_MOR	=	44,9	43,8	55,8
4_CRO	=	50,9	46,2	54,3

<48 48<X<52 >52

The graph and the table represent, in the Rumanian group, the EEG Learning metric for each Creative Hypothesis. The Learning is good only in the Car Creative Hypothesis where the metric is active in two approach phases. In the others Creative Hypotheses the Learning metric reaches an average level, so the Creativity are considered fair.

Language 3_ROMANIAN

Evocative



		STEPS		
CREAT. HP.		1	2	3
1_SIL	=	43,3	41,1	59,2
2_CAR	X	39,1	42,7	46,8
3_MOR	V	54,5	49,8	52,9
4_CRO	=	45,7	40,1	55,3

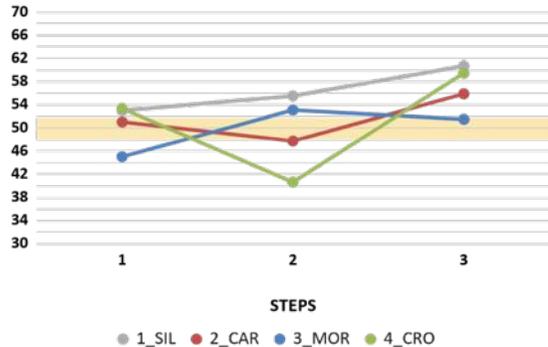
<48 48<X<52 >52

The graph and the table represent, in the Rumanian group, the Evocative EEG metric for each Creative Hypothesis. The Evocative metric is good only in the Morgue Creative Hypothesis where the metric is active in two approach phases. In the Silhouette and Crossing Creative Hypotheses the Evocative metric reaches an average level, so they are considered fair and the Car Creative Hypothesis isn't acceptable because Evocative is too low.

EEG - Reaction - Romanian language

Language 3_ROMANIAN

Simplicity



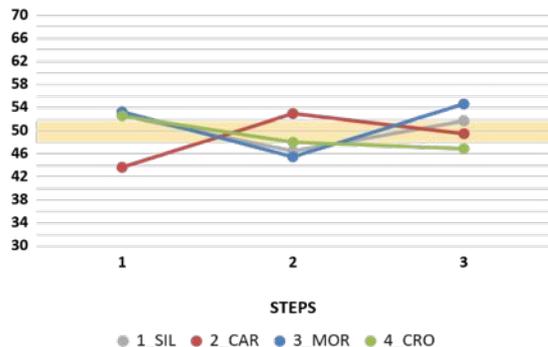
Simplicity		STEPS		
CREAT. HP.		1	2	3
1_SIL	V	53,0	55,6	60,7
2_CAR	=	51,1	47,8	55,9
3_MOR	=	45,1	53,1	51,5
4_CRO	V	53,4	40,7	59,5

<48 48<X<52 >52

The graph and the table represent, in the Rumanian group, the EEG Simplicity metric for each Creative Hypothesis. The Simplicity metric is good in the Silhouette and Crossing Creative Hypothesis because it's active in 2 or 3 approach phases. In the other Creative Hypotheses Simplicity metric reaches an average level, so the Creativities are considered fair.

Language 3_ROMANIAN

Cognitive Relax



Cognitive Relax		STEPS		
CREAT. HP.		1	2	3
1_SIL	=	52,7	46,5	51,7
2_CAR	=	43,7	53,0	49,5
3_MOR	V	53,3	45,5	54,7
4_CRO	=	52,6	48,0	46,9

<48 48<X<52 >52

The graph and the table represent, in the Rumanian group, the EEG Cognitive Relax metric for each Creative Hypothesis. The Cognitive Relax metric is good only in the Morgue Creative Hypothesis where the metric is active in two approach phases. In the other Creative Hypotheses the metric reaches an average level, so they are considered fair.

1_Silhouette Creativity Eye-tracking and EEG Analysis - Romanian Language



The Silhouette creativity hasn't critical areas. Visibility is very good. At the third approach phase Attention, Learning and Evocative are activated while Cognitive Relax metric is activated at the first step and then descend and ascend. Simplicity is always active during the three steps. The construction of the communication is helped by the graphic structure of the texts. This means that the contents of the communication arrived at the sample in the correct way, but not in a quick way. The hotspot of the fourth step confirms that the visual has been seen in the first three and the sample just wants to deepen the claim.

3_RUM

CREAT. HP.	AOI	Attention	Learning	Evocative	Simplicity	Cognitive Relax	Participant	FixDur
1_SIL	01_TEXT1	53,9	61,5	50,7	65,2	43,2	13	191
	02_TEXT2	49,1	58,6	43,0	50,8	56,3	26	180
	03_VISUA	49,0	47,7	62,0	37,3	43,9	18	230
	04_LOGO1	52,4	51,6	44,9	42,1	38,4	12	231
	05_LOGO2	36,7	36,2	35,8	41,7	41,1	4	210
	06_LOGO3	32,3	48,9	24,9	60,0	52,3	4	197

4_Crossing Creativity Eye-tracking and EEG Analysis - Romanian Language



In Crossing Creativity, the EEG reaction grows in the last step but very slowly. This means that the recognition of the objects present in the communication, even if observed, are not distinguished from a distance. In addition, the Simplicity actives at the beginning is lowered to the second step to grow back to the third. This means that more effort is made in the second step than in the third step to distinguish the contents of creativity. The Cognitive Relax drops proportionally. In the fourth step the visual attention is on the text. This confirms that the visual part in the third step has been communicated and that it needs to be improved in order to be seen from a distance increasing the recognizability of visual objects: puppy and bear.

3_RUM

CREAT. HP.	AOI	Attention	Learning	Evocative	Simplicity	Cognitive Relax	Participant	FixDur
4_CRO	01_TEXT1	42,0	52,9	42,0	58,8	53,9	15	167
	02_TEXT2	45,8	48,7	51,5	50,9	53,8	27	197
	03_VISUA	38,5	45,7	44,4	49,1	50,5	19	244
	04_LOGO1	54,0	52,3	46,9	73,9	34,8	10	212
	05_LOGO2	61,6	49,0	42,3	69,5	64,8	4	213
	06_LOGO3	66,4	17,6	92,4	34,8	30,6	1	408

2_Car Creativity Eye-tracking and EEG Analysis - Romanian Language



The visibility of Car Creative Hypothesis is not the best, but it is good, while the EEG reactions perform well. Attention and learning are already active in the second and third step. Cognitive Relax metric is active in the second step and drops a bit in the third while Simplicity activates in the last step. There is no Evocative, so the representation of the scene needs to be improved. The hotspot of the fourth step confirms that the sample needs to go deeper into details of the visual that could have already been made visible earlier.

3_RUM

CREAT. HP.	AOI	Attention	Learning	Evocative	Simplicity	Cognitive Relax	Participant	FixDur
2_CAR	01_TEXT1	54,5	46,7	45,0	56,0	55,5	11	257
	02_TEXT2	53,7	51,6	46,0	57,2	54,1	19	275
	03_VISUA	43,2	46,0	46,5	52,8	47,0	28	242
	04_LOGO1	39,2	47,8	38,6	49,8	56,3	13	284
	05_LOGO2	26,5	42,8	44,6	67,9	48,9	4	288
	06_LOGO3	52,9	62,1	84,5	80,1	67,2	3	167

3_Morgue Creativity Eye-tracking and EEG Analysis - Romanian Language



Morgue Creativity does not activate Attention at any stage. It's active in Evocative and Cognitive Relax. Only at the last stage it activates Learning, but given its poor performance in visibility it is difficult to attribute a good overall performance. In the fourth step all the attention is directed to the toe tag. This information can hardly be perceived in speed and distance.

3_RUM

CREAT. HP.	AOI	Attention	Learning	Evocative	Simplicity	Cognitive Relax	Participant	FixDur
3_MOR	01_TEXT1	39,3	39,6	49,7	42,8	30,2	8	242
	02_TEXT2	39,5	45,6	49,4	44,0	49,0	17	190
	03_VISUA	52,0	48,6	51,1	53,3	49,3	30	291
	04_LOGO1	38,9	56,1	46,3	52,3	60,1	10	230
	05_LOGO2	57,4	48,1	52,4	39,2	51,6	8	186
	06_LOGO3	55,1	59,0	72,6	64,5	48,1	3	167

Summary - Romanian Language

Language 3_ROMANIAN



3_ROMANIAN	1_Silhouette	2_Car	3_Morgue	4_Crossing
Participants	V	V	V	V
Visibility FixTarget/FixTot	V	=	=	V
Fixations Duration	V	X	X	V
Attention	=	V	X	=
Learning	=	V	=	=
Evocative	=	X	V	=
Simplicity	V	=	=	V
Cognitive Relax	=	=	V	=

The green frames highlight the best Creative Hypotheses, the yellow one the second. Crossing and Silhouette Creative Hypotheses are the best because they reach a quite good cognitive performance (EEG metrics) and a good visual performance (Eye-tracking metrics). Car Creative Hypothesis is the second classified because it has a quite good cognitive performance (EEG metrics), while the visual performance (Eye-tracking metrics) is sufficient.

Creative Hypotheses - Spanish Language



1

Silhouette



2

Car



3

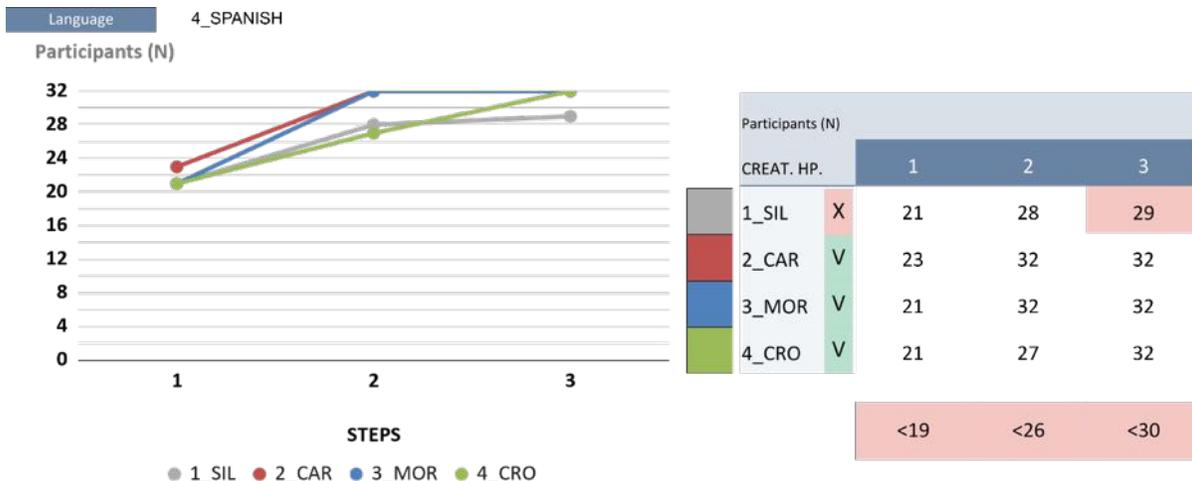
Morgue



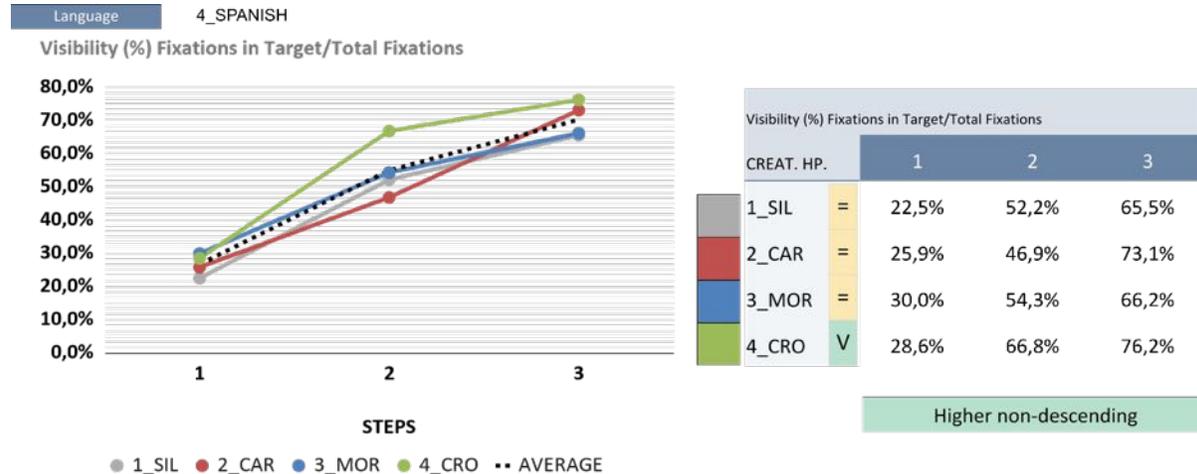
4

Crossing

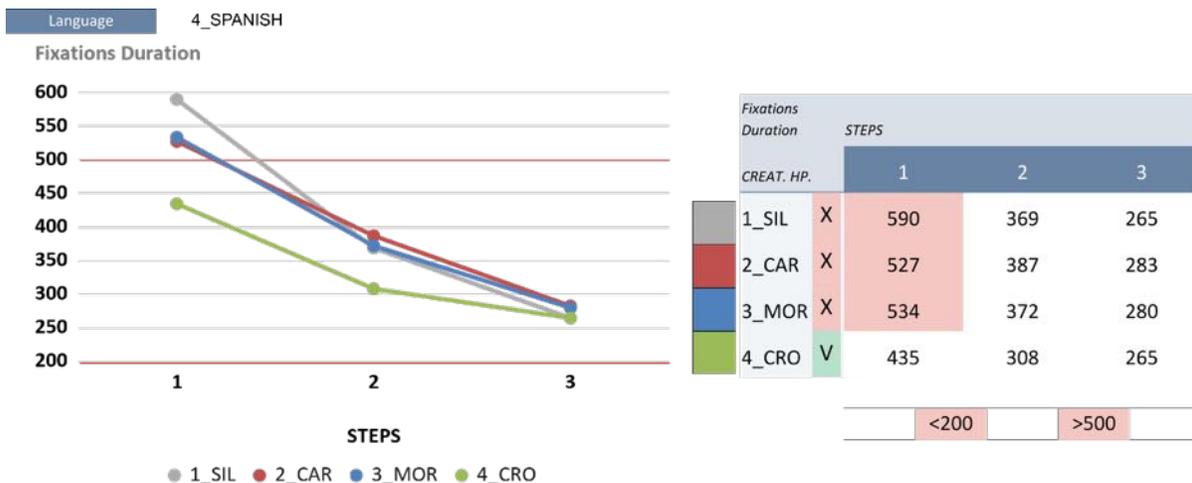
Eye-tracking analysis - Spanish language



All the Creative Hypotheses, except for Silhouette, reach the best Participants Number, so they are seen by the whole sample and they are acceptable.



The Creative Hypothesis Crossing reaches a good level of Visibility (the metric is higher and non-descending). The Visibility of the others Creative Hypotheses reaches a medium level, so they are fair.



The Crossing Creativity is the best because the metric is between the effectiveness thresholds and, in the second and third step, is fewer than the others. The other Creativity aren't acceptable because in the first approach phase the Fixations Duration is higher than 500 ms. (it's over the threshold of efficacy).

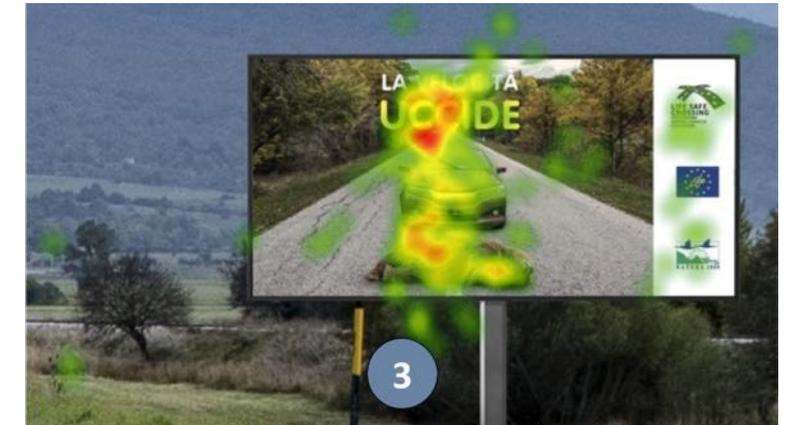
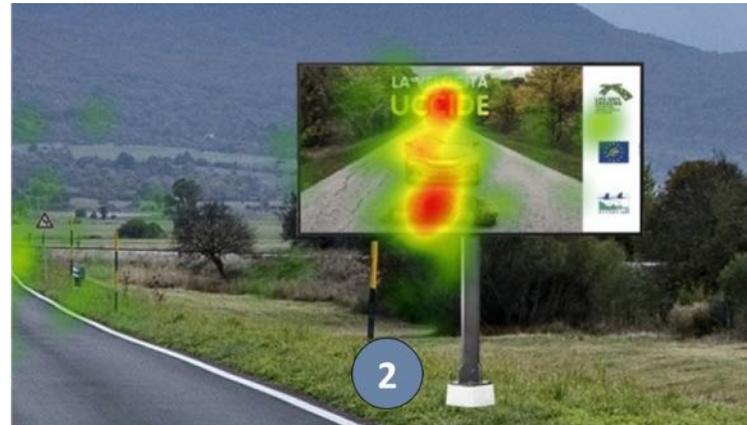
Eye-tracking analysis - 1_Silhouette Spanish



Silhouette Creative Hypothesis has a very poor visual performance. At the third step it doesn't reach the threshold of the participants, at the first step it has a very high average observation time and the percentage of fixations in target is low.

In the first approach phase the greatest concentration is on the lynx outline and participants find difficult to focus on it (very high fixation time). In the second approach phase the focus is on the second line of text and the braking marks. The text "Ralentiza", which represents the main message, is little observed. From this information it can be deduced that from a distance a great effort is made to observe the figure, for that reason the communication is not so attractive.

Eye-tracking analysis - 2_Car Spanish



Car Creativity manages to increase the number of participants who observe it quickly.

The percentage of fixations in targets is also very high, but the cognitive effort in the first approach phase is above the threshold.

In the second and third approach phase the subjects correctly observe the details of the car accident; first the accident then the text message.

Creativity visually works very well.

Eye-tracking analysis - 3_Morgue Spanish



Morgue Creativity reaches a very good number of participants, but it's not as attractive as the others and from afar it has a very high average fixation time too.

From the hotspot of the second approach phase you can see that there is a lot of visual attention in the white space between the foot and the paw.

It means that time and effort is spent fixing a part of the communication without content: this is a very serious problem!

Eye-tracking analysis - 4_Crossing Spanish



Crossing Creativity is the best performing visually. The number of participants grows regularly along the three approach phases and the percentage of average fixations in target is the highest.

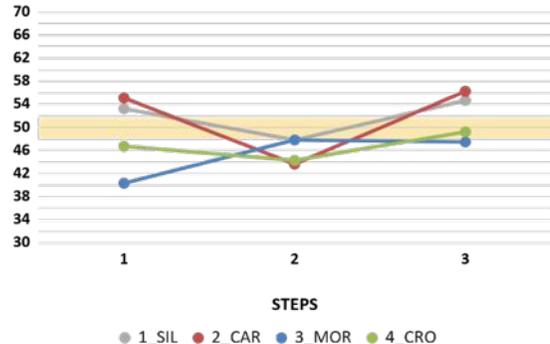
This Creativity is the only one in the group that can keep the average fixation time below the threshold at the first step: this is due to the fact that the representation of the animal is well distinguishable from afar because of the high contrast.

In the second approach phase all the communication is observed, and in the third one only the animal's snout and one puppy. This means that the elements contained in the communication have all been observed in the 3 approach phases.

EEG - Reaction - Spanish language

Language 4_SPANISH

Attention



Attention		AVVICINAMENTO		
CREAT. HP.		1	2	3
1_SIL	V	53,3	47,9	54,7
2_CAR	V	55,1	43,7	56,3
3_MOR	X	40,3	47,9	47,5
4_CRO	X	46,8	44,3	49,3

<48 48<X<52 >52

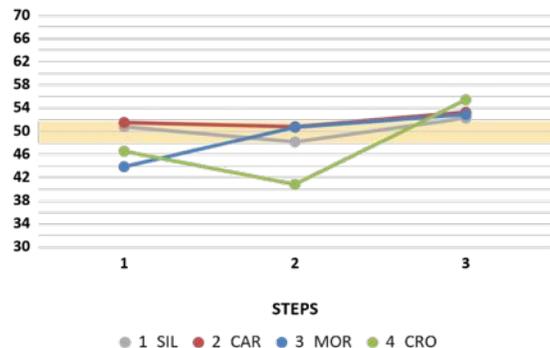
The graph and the table represent, in the Spanish group, the EEG Attention metric for each Creative Hypothesis.

The Attention is good in the Silhouette and Car Creative Hypotheses where the metric active in approach phases 1 and 3.

In the Morgue and Crossing Creative Hypotheses the Attention metric isn't acceptable because it's too low.

Language 4_SPANISH

Learning



Learning		STEPS		
CREAT. HP.		1	2	3
1_SIL	V	50,9	48,2	52,3
2_CAR	V	51,6	50,9	53,3
3_MOR	=	43,9	50,8	52,9
4_CRO	=	46,6	40,9	55,5

<48 48<X<52 >52

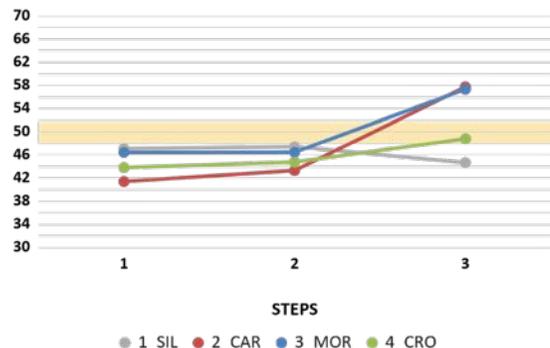
The graph and the table represent, in the Spanish group, the EEG Learning metric for each Creative Hypothesis.

The Learning is good only in the Silhouette and Car Creative Hypotheses where the metric is active in the third approach phase while in the others is in routine.

In the others Creative Hypotheses the Learning metric reaches an average level, so it's considered fair.

Language 4_SPANISH

Evocative



Evocative		STEPS		
CREAT. HP.		1	2	3
1_SIL	X	47,1	47,4	44,7
2_CAR	=	41,4	43,3	57,8
3_MOR	=	46,5	46,5	57,4
4_CRO	X	43,8	44,8	48,8

<48 48<X<52 >52

The graph and the table represent, in the Spanish group, the Evocative EEG metric for each Creative Hypothesis.

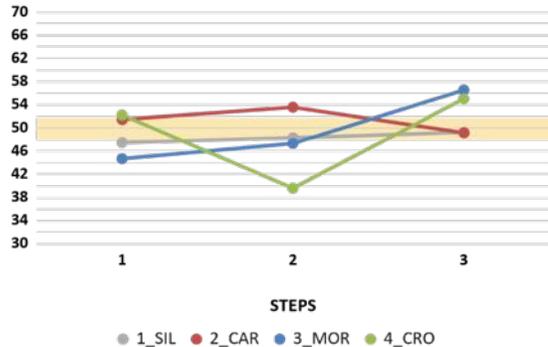
The Evocative metric is fair only in the Car and Morgue Creative Hypotheses where the metric is active in the third approach phase, but non-active in first and second step.

In the Silhouette and Crossing Creative Hypotheses the Evocative metric isn't acceptable because it's too low.

EEG - Reaction - Spanish language

Language 4_SPANISH

Simplicity



Simplicity		STEPS		
CREAT. HP.		1	2	3
1_SIL	=	47,5	48,4	49,3
2_CAR	V	51,5	53,6	49,2
3_MOR	=	44,7	47,4	56,6
4_CRO	V	52,3	39,6	55,1

<48 48<X<52 >52

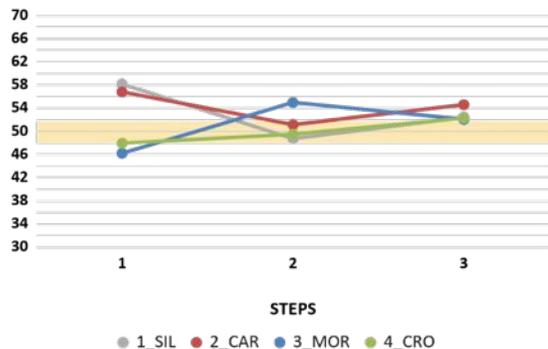
The graph and the table represent, in the Spanish group, the EEG Simplicity metric for each Creative Hypothesis.

The Simplicity metric is good in the Car and Crossing Creative Hypotheses.

In Morgue and Silhouette Creative Hypotheses Simplicity metric reaches an average level, so it's considered fair.

Language 4_SPANISH

Cognitive Relax



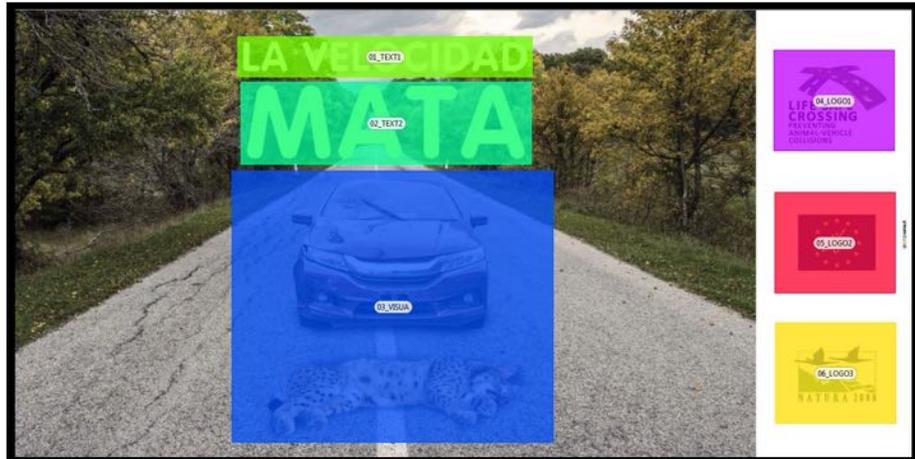
Cognitive Relax		STEPS		
CREAT. HP.		1	2	3
1_SIL	V	58,2	48,8	52,5
2_CAR	V	56,8	51,2	54,6
3_MOR	V	46,2	55,0	52,1
4_CRO	=	48,0	49,6	52,3

<48 48<X<52 >52

The graph and the table represent, in the Spanish group, the EEG Cognitive Relax metric for each Creative Hypothesis.

The Cognitive Relax metric is good in all the Creative Hypotheses except for the Crossing one which is fair.

2_Car Creativity Eye-tracking and EEG Analysis - Spanish Language



Car Creativity has good visibility and the best EEG reaction of the group. In the third step it manages to activate all the metrics except Simplicity which was active in the second step. From a distance it can activate Attention and Cognitive Relax.

The composition can improve the performance, especially in the second step, increasing the recognizability of the animal: in this way it is possible to anticipate the activation of Evocative and Learning.

This is confirmed by the fact that the face of the lynx is the point of interest of the fourth step.

4_ESP

CREAT. HP.	AOI	Attention	Learning	Evocative	Simplicity	Cognitive Relax	Participant	FixDur
2_CAR	01_TEXT1	31,4	36,1	55,0	51,5	43,8	9	236
	02_TEXT2	52,4	54,8	62,6	52,8	61,3	20	174
	03_VISUA	46,6	48,0	56,4	59,6	49,4	30	290
	04_LOGO1	48,8	54,3	37,1	40,8	45,2	8	269
	05_LOGO2	53,9	61,4	40,0	55,3	48,0	5	175
	06_LOGO3	65,4	38,1	96,7	54,2	42,6	1	92

4_Crossing Creativity Eye-tracking and EEG Analysis - Spanish Language



Crossing Creative Hypothesis has excellent visibility, but the EEG reactions are not so good, in fact it is not able to activate Attention and Evocative.

The the second phase is the most critic because Learning and Simplicity fall a lot. It means that it is very difficult to distinguish the objects and contents of the communication. In the fourth step, the specifics of the lynxes' family are explored in more detail because there was no way to do so before.

Communication can be improved by working on visibility and readability: it may be sufficient to enlarge the animal family and split the text. For example "Vivo o muerto" at the top and the rest at the bottom.

Adjectives to the singular can mislead the sense of the sentence

4_ESP

CREAT. HP.	AOI	Attention	Learning	Evocative	Simplicity	Cognitive Relax	Participant	FixDur
4_CRO	01_TEXT1	57,3	53,4	54,1	54,3	58,0	11	137
	02_TEXT2	50,3	48,4	51,3	44,6	53,2	19	201
	03_VISUA	49,6	47,6	50,1	48,6	49,0	25	338
	04_LOGO1	50,3	45,1	54,5	46,6	35,7	3	221
	05_LOGO2	89,8	97,1	92,2	9,7	98,0	1	100
	06_LOGO3	84,6	80,7	94,8	50,1	76,1	2	152

3_Morgue Creativity Eye-tracking and EEG Analysis - Spanish Language



Visually Morgue Creativity is not very performing and fails to attract Attention. Evocative is able to activate itself in the last approach phase in a simple way and with high Cognitive Relax.

The biggest problem is from distance when almost all the indicators are non-active and do not recover in the second step.

This happens because the message is difficult to perceive from a distance and this is confirmed by the fourth step where all the visual attention is focused on the toe label (hotspot).

4_ESP

CREAT. HP.	AOI	Attention	Learning	Evocative	Simplicity	Cognitive Relax	Participant	FixDur
3_MOR	01_TEXT1	49,1	47,9	36,3	47,2	52,4	6	181
	02_TEXT2	49,8	40,3	40,5	40,2	43,7	10	192
	03_VISUA	44,5	44,5	46,6	52,8	51,1	30	295
	04_LOGO1	47,6	34,0	63,5	43,9	43,7	7	198
	05_LOGO2	79,9	47,7	71,3	43,2	44,7	4	140
	06_LOGO3	58,4	49,5	49,2	44,5	43,4	3	215

1_Silhouette Creativity Eye-tracking and EEG Analysis - Spanish Language



Although Silhouette Creativity has a low visual performance, it can generate, in the first and last step, Attention and Learning with Cognitive Relax.

Evocative and Simplicity are never activated. This means that it is very difficult to distinguish the objects of communication.

The fourth step focuses the attention on the second line of the message, so the participants believe to have exhausted the visual information of the chalk outline even if the representation has not been understood (low Evocative in the three steps).

4_ESP

CREAT. HP.	AOI	Attention	Learning	Evocative	Simplicity	Cognitive Relax	Participant	FixDur
1_SIL	01_TEXT1	39,6	53,1	52,8	47,5	62,7	14	182
	02_TEXT2	50,5	48,2	47,7	55,4	45,9	24	190
	03_VISUA	53,2	48,0	52,7	52,3	53,7	18	237
04_LOGO1	42,5	52,8	53,8	68,5	53,8	11	264	
05_LOGO2	53,0	49,0	31,6	61,1	49,4	8	154	
06_LOGO3	78,3	70,0	37,0	54,2	41,4	2	291	

Summary - Spanish Language

Language 4_SPANISH



4_SPANISH	1_Silhouette	2_Car	3_Morgue	4_Crossing
Participants	X	V	V	V
Visibility FixTarget/FixTot	=	=	=	V
Fixations Duration	X	X	X	V
Attention	V	V	X	X
Learning	V	V	=	=
Evocative	X	=	=	X
Simplicity	=	V	=	V
Cognitive Relax	V	V	V	=

The green frame highlights the best Creative Hypothesis, the yellow one the second. Car Creative Hypothesis is the best because it reaches a good cognitive performance (EEG metrics) and a sufficient visual performance (Eye-tracking metrics). Crossing Creative Hypothesis is the second classified because it has a good visual performance (Eye-tracking metrics), but a sufficient cognitive performance (EEG metrics).

Summary Approach phases 1-3

The **2_Car** and **4_Crossing** creativities are the ones that perform best on a perceptual level.

According to the objective of the research and the context in which the public will come into contact with the billboards, we consider that **perceptive results (ET and EEG) should lead the main decision.**

We suggest using the interview results to discriminate which of the two are coherent with the perceptual results to further improve their performance.

	1_SILHOUETTE	2_CAR	3_MORGUE	4_CROSSING
1_ITALIAN				
2_GREEK				
3_ROMANIAN				
4_SPANISH				

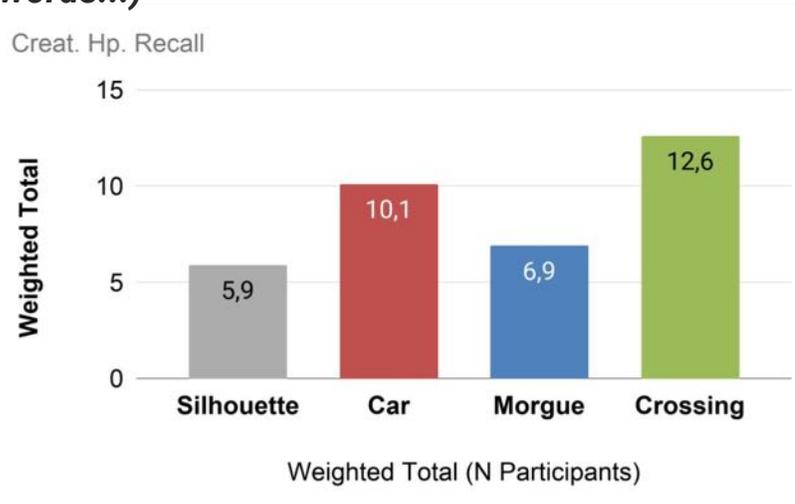


Post test Rational Interview

Spontaneous recall

What do you remember seeing during the test? (colors, posters, words...)

Creat. Hp. Recall	1st position	2nd position	3rd position	4th position	Weighted Total
Silhouette	4	2	1	0	5,9
Car	8	2	1	1	10,1
Morgue	5	2	1	0	6,9
Crossing	10	2	2	1	12,6



The result shown in the summary of the approach phases 1-3 are strengthened by the spontaneous recall in the interview where Crossing and Car Creative Hypotheses reach the best performances. In particular, the participants have mentioned the 4 Creative Hypotheses in different positions as shown in the Table. The most memorable Creative Hypothesis is Crossing, followed by Car.

Almost the whole sample described the global message: decrease speed for wild animals and people safety.

Four women recall both bears and lynxes crossing the road (Crossing).

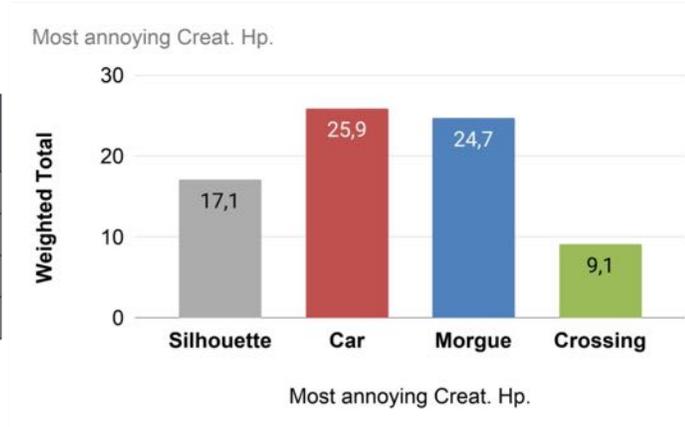
Three men (2 Spanish, 1 Italian) recall the exact sentence “La velocità uccide/Velocidad mata” (Speed kills).

Silhouette Creative Hypothesis quotes report the drawing on the the street and rarely the hard braking. Car Creative Hypothesis quotes report the car and the bear lying on the road. Morgue Creative Hypothesis quotes report the different feet and the 50km/h label. Crossing Creative Hypothesis quotes report wild animals crossing the road, mum with puppies, bears and lynxes (or cheetah).

Most annoying and Emotionally Strong Creative Hypothesis (Ranking)

Ranking of these creative hypotheses compared to how annoying they are (at the most annoying 1, at the least annoying 4)

Most annoying Creat. Hp.	1st position	2nd position	3rd position	4th position	Weighted Total
Silhouette	5	2	19	6	17,1
Car	15	12	5	0	25,9
Morgue	12	15	4	1	24,7
Crossing	0	3	4	25	9,1

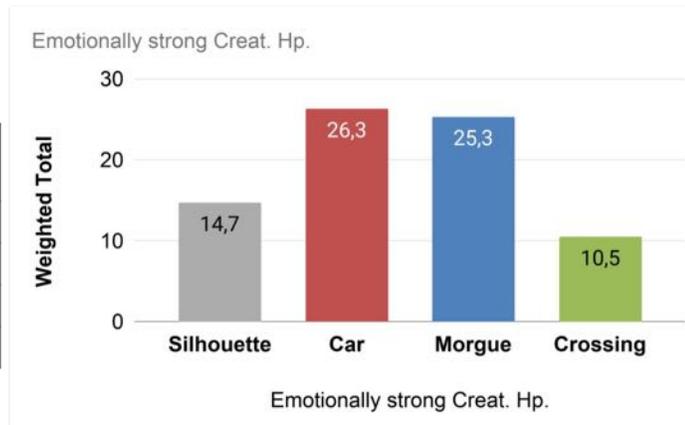


The following results also depend on a rational reasoning made after seeing the posters many times.

The sample, in general, responding to the questions asked, expresses that the more explicit messages have a stronger impact: 4_Crossing creativity don't reach the ratings of the others.

Make the ranking of these creative hypotheses compared to how emotionally strong they are in a negative sense (the stronger emotionally gives 1, the less strong emotionally 4)

Emotionally strong Creat. Hp.	1st position	2nd position	3rd position	4th position	Weighted Total
Silhouette	1	3	20	8	14,7
Car	15	14	3	0	26,3
Morgue	14	13	4	1	25,3
Crossing	2	2	5	23	10,5



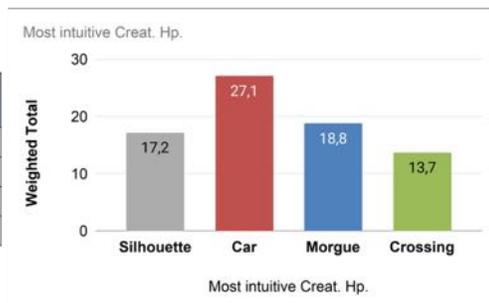
Car and Morgue are both impacting audience.

Evidently their content is more explicit than the others.

Most Intuitive, clear, convincing and effective

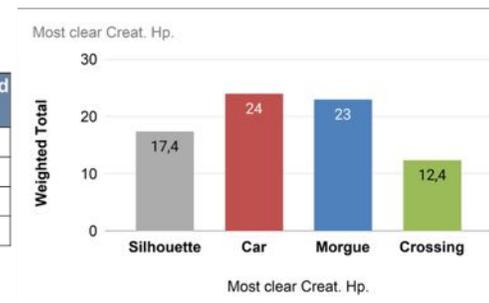
Ranking these creative hypotheses against how intuitive they are (at the most intuitive 1, at the least intuitive 4)

Most intuitive Creat. Hp.	1st position	2nd position	3rd position	4th position	Weighted Total
Silhouette	5	7	11	9	17,2
Car	20	7	4	1	27,1
Morgue	5	12	8	7	18,8
Crossing	2	6	9	15	13,7



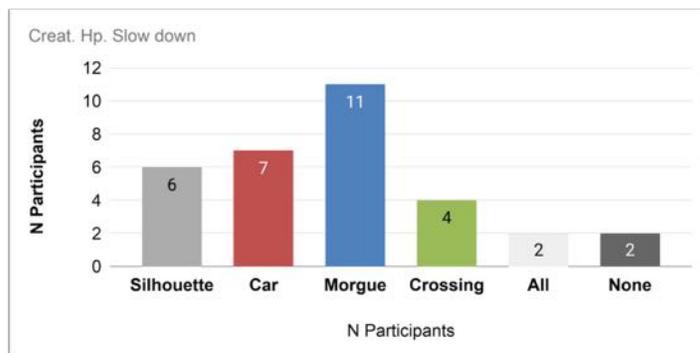
Make the ranking of these creative hypotheses compared to how much they are clear (at the clearest 1, at the least clear)

Most clear Creat. Hp.	1st position	2nd position	3rd position	4th position	Weighted Total
Silhouette	8	2	12	10	17,4
Car	12	13	5	2	24
Morgue	10	13	7	2	23
Crossing	2	4	8	18	12,4



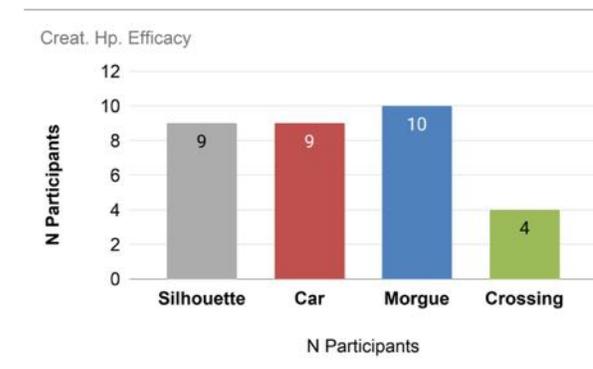
Which one of these creative hypotheses can convince you to slow down?

Creat. Hp. Slow down	N
Silhouette	6
Car	7
Morgue	11
Crossing	4
All	2
None	2



Which of these 4 creative hypotheses do you think is the most effective?

Creat. Hp. Efficacy	N
Silhouette	9
Car	9
Morgue	10
Crossing	4



2_Car is considered the most intuitive while 3_Morgue the most effective to slow down.

Except for 4_Crossing, all creativities are considered to be effective.

Claims Insights

Car and **Morgue** Creative Hypotheses are the most clear and intuitive also without the sentence.

Among these three claims (“Slow down or leave a mark”, “Speed kills” and “Dead or alive? It's up to you too! Slow down”), we asked the participants which one is the most suitable to be included in a poster, in their opinion:

- **22** people say that “Speed kills” is the claim most suitable to be included in a poster, for
- **5** people “Slow down or leave a mark” and for
- **5** participants “Dead or alive? It's up to you too! Slow down”.

Only 6 people said that all the Creative Hypotheses are clear and intuitive without sentences.

Quella con l'auto non serve la scritta, in obitorio anche la scritta non serve (Italian Woman)
Sì è evidente che c'è un incidente (cartellino o auto), ma l'animale non è molto credibile (Spanish Woman)
Forse solo quella con il cartellino con 50 km/h (Italian Man)

Indica di stare attento, di rallentare, se vedi una cosa del genere devi rallentare (Spanish Woman)
Un animale a terra vuol dire che devo fare attenzione o rallentare. Tutte si capiscono (Spanish Man)
Vedi frenata, orso morto, cartellino obitorio, orsi che passano (attenzione possono passare) (Italian Woman)

Claims Insights

Especially, **Silhouette** and **Crossing** Creative Hypotheses aren't clear nor intuitive from distance without claim. Without claim the **Crossing** Creative Hypothesis is not intuitive because the image of a mother with her puppy is reminiscent of a safari or a WWF advertisement.

However, participants report that **Crossing** Creative Hypothesis reminds to slow down without cruelty, but the claim is too long.

Non chiarissima, ci vuole un attimo, c'è la frenata e il disegno dell'animale per terra (Spanish Woman)
Ha bisogno del testo, gli pneumatici non si vedono tanto, sennò sembrano messaggi di ciclismo in strada (Italian Man)
Sembra un disegno a terra (Romanian Man)
L'ultima no perché vedi che attraversano, ma non si capisce cosa devi fare, non intuitivo. (Italian Woman)
Potrebbe essere oh che bello qui vedi gli orsi (Italian Man)
Senza frase non si capisce, foto di uno zoo (Greek Man)
C'è uno zoo vicino, pubblicità zoo? (Spanish Man)
Se non leggo non capisco, ci sono animali che attraversano la strada e devo stare attento, meno chiara (Italian Woman)
Non me la ricordavo, se non leggi potrebbe essere un safari, stanno tranquilli (Spanish Woman)
Non dà idea di pericolo, è tenera più che altro (Spanish Woman)
Senza leggere fa pensare alla famiglia (Romanian Man)
Sembra pubblicità del WWF non dà senso dello stare attento (Spanish Man)

Attira l'attenzione, ma con più leggerezza, non crudeltà, ma fa capire il problema (Italian Woman)
Sembrano allegri non in pericolo di vita, mamma col piccolo che va in giro (Romanian Woman)
Rallenta per la vita degli animali (Spanish Woman)
Troppo testo, da lontano non è una allerta. Sembra un avviso qualsiasi, non aumenta l'attenzione (Spanish Woman)
Fa tenerezza, è carina la scritta perché dà idea che la vita di queste 2 creature dipenda da te, ma è lunga da leggere (Romanian Man)
Fa meno effetto, orso vivo che trotterella allegro, mamma con cucciolo è meno scioccante. Può essere stand alone, ma ha troppe parole (Italian Man)

Creativity Hypothesis Choice

First place	Second place	Third place	Fourth place
			
2_CAR	4_CROSSING	1_SILHOUETTE	3_MORGUE

According to the research objective, we consider 2_CAR the most performing creative hypothesis due to its EEG performance and the best interview results.

4_Crossing is in second place for its very high visual performance.

3_Morgue is in last place for its low perceptual results.

In the following chapter we suggest how to increase all the creative hypotheses.



How to improve the creativity hypotheses

2_Car Insight

2_Car Creativity has the best EEG response, but visibility can be improved.

- Visibility effort can be decrease separating communication objects (Car from the animal).
- The bear's snout must be more marked and the car damage more recognizable.
- The car could be put into perspective to accentuate the signs of damage.
- Texts should be bigger and contrasted to balance the composition.
- The dynamics of the accident should be more realistic.
- During the Interview people explained that the elements of the Car Creative Hypothesis aren't composed in the right way (colors, car, accident dynamics...). Only the animal is killed in the accident, the driver and any passengers are not seriously injured.
 - *Non è reale, ha qualcosa che non va (Italian Woman)*
 - *Sembra una montatura, è inverosimile che succeda così, dovrebbe finire dietro l'auto l'orso (Italian Man)*
 - *Sembra ci sia la guida a destra (Italian Man)*
 - *Danni al parabrezza bassi per essere un orso (Italian Man)*
 - *Un incidente, animale morto, provocato da autista. La conseguenza è un animale morto perché io andavo veloce, però non è così forte. Mi dispiace, ma mi rassicura che nonostante ciò alla persona non è successo niente di fatale. (Greek Man)*
 - *La scritta va bene, ma i colori non si vedono rispetto allo sfondo (Greek Man)*
 - *Senza aver letto la frase sembrava la pubblicità di un'auto (Romanian Man)*

Stimulus	2_Car			
2_Car	1_ITALIAN	2_GREEK	3_ROMANIAN	4_SPANISH
Participants	V	X	V	V
Visibility FixTarget/FixTot	=	=	=	=
Fixations Duration	X	X	X	X
Attention	V	=	V	V
Learning	=	V	V	V
Evocative	V	V	X	=
Simplicity	V	V	=	V
Cognitive Relax	V	=	=	V

The Message: the emotional impact of the 2_Car Creative Hypothesis is negative and strong. You see the wild animal dead because of you, because of the speed driving. People report sentiments of pain and suffering for the animal dead. It's a raw picture.

2_Car Selected Verbatim

Forte perché si vede la macchina incidentata, danneggiato anche chi c'era all'interno e ucciso l'orso. (Italian Woman)

Dà un impatto importante, animale morto, colpisce (Italian Woman)

È cruda, se vai addosso a un orso anche tu ti fai male, ma è troppo forte (Italian Woman)

È più forte perché si vede l'animale. Potevi stare più attento (Romanian Woman)

Vedendo l'animale morto mi spiace (Romanian Woman)

È altrettanto forte, fa ancora più pena perché c'è l'animaletto, per persone sensibili è troppo forte. (Spanish Woman)

È più d'impatto perché vedi la macchina conca e l'animale morto, si evidenzia di più l'incidente (Spanish Woman)

L'ho vissuto per 3 volte, animale selvatico che non si vede da dove arriva, rimane forte come impatto. (Spanish Woman)

Come immagine l'orso morto e la macchina scassata è forte (Greek Man)

Fa capire di più che oltre all'orso anche tu non ne esci illeso, lascia il segno a tutti e due. Il danno ce l'hai anche tu, ma vedo morto solo l'orso. (Italian Man)

Impatto molto emotivo. Dà subito l'idea di animale morto sulla strada, incidente e velocità (Italian Man)

È un po' pesante, rimani male che hai ucciso un animale (Romanian Man)

4_Crossing Insight

4_Crossing Creative Hypothesis has a good visibility performance but not its EEG reaction.

- Visibility and Fixations time are good because the main figure is easy to identify: the image is contrasted and with a lot of fixation points.
- Scene has to be better contextualized to make attention grow: the bear could look directly into the camera showing that he is realizing the imminent collision.
- The contrast of the claim on the green background and the animals on the grey of the road works.
- Improve the identification of the bear cub.
- Communication can be improved by working on visibility and readability: it may be sufficient to enlarge the animal family and split the text. For example "Vivo o muerto" at the top and the rest at the bottom.

The message: the impact of the 4_Crossing Creative Hypothesis is quite positive. This Creative Hypothesis has a better emotional impact on the participants: it has a positive message! The image represents a concrete and real situation: wild animals crossing the road in a forest. Some participants experienced this situation and wild animals with puppies are tender. You have to be careful and slow down to protect them.

Stimulus		4_Crossing			
		1_ITALIAN	2_GREEK	3_ROMANIAN	4_SPANISH
4_Crossing					
Participants		V	V	V	V
Visibility FixTarget/FixTot		V	V	V	V
Fixations Duration		V	V	V	V
Attention		=	V	=	X
Learning		X	V	=	=
Evocative		V	V	=	X
Simplicity		V	=	V	V
Cognitive Relax		X	X	=	=

2_Crossing Selected Verbatim

È un messaggio più positivo, negli altri è già successo incidente, meglio prevenire che curare, negli altri qualcuno è morto, animale o persona, hanno già infranto la legge. Significa: attenzione, la sopravvivenza degli animali dipende anche da voi. Fa meno colpo, le altre immagini potrebbero creare tensione nell'autista, potrebbero anche essere la causa dell'incidente interpretare il messaggio (Greek Woman)

Orso con cucciolo attira di più l'attenzione, piace più vivo che morto, lo vedo in tempo e evito l'altro (Italian Woman)

Immagine che capita spesso in Grecia, abbastanza carino, cerchiamo di garantire la loro sopravvivenza, non disturbare habitat, siamo noi che abbiamo interrotto il bosco, loro non sanno interpretare i pericoli, le persone devono stare attente per la sopravvivenza di entrambi! (Greek Woman)

Situazione reale che potrebbe accadere realmente, potresti vederla davvero mentre guidi una scena del genere. Il fatto che ci sia anche il cucciolo avvalorava l'immagine (Italian Woman)

Il fatto di vedere animale vivo e la segnalazione di attenzione rallenta, rischi di ucciderlo cattura come l'altro, ma in positivo: manteniamolo vivo! (Italian Woman)

Rischi di uccidere qualcosa di bello (Italian Woman)

Un animale non sa che passa la macchina, chi guida deve stare attento (Romanian Woman)

Mi piace perché fa una domanda: vivo o morto? Dipende da voi, l'attenzione verso l'animale che può attraversare all'improvviso la strada, animale insieme al piccolo dà sensazione di madre con bambino, materna, mi piace di più. Mi dà la responsabilità, seguo anche inconsciamente il suggerimento di rallentare (Greek Man)

Stare all'erta perché gli animali potrebbero apparire da un momento all'altro sul ciglio della strada, è una zona soggetta, oltre al fatto di rallentare (Italian Man)

1_Silhouette

1_Silhouette Creative Hypothesis in general is not so well perceived.

- Visually, when the text occupies the entire width horizontally allows the participants to better perceive the chalk outline snout: the width of the writing develops a better perception of communication.
- Bear chalk outline should be more contrasted using a wider irregular chalk line. This could be change the billboard perception.
- Text should be placed at the bottom of the communication, over tyres brakes to be read better (the contrast would be higher).

The message: the impact of the Silhouette Creative Hypothesis is multifaceted: from an emotional point of view the Creativity message is strong. A poor animal is dead. You need to reflect on the speed driving and to pay attention to wild animals or you'll leave an irreversible mark. Moreover, instead of a bear, there could be a child.

The text "Ralentiza", which represents the main message, is little observed. From this information it can be deduced that from a distance a great effort is made to observe the figure, for that reason the communication is not so attractive.

Stimulus		1_Silhouette			
					
1_Silhouette		1_ITALIAN	2_GREEK	3_ROMANIAN	4_SPANISH
Participants		X	V	V	X
Visibility FixTarget/FixTot		X	=	V	=
Fixations Duration		V	V	V	X
Attention		V	=	=	V
Learning		=	X	=	V
Evocative		=	X	=	X
Simplicity		=	=	V	=
Cognitive Relax		=	X	=	V

1_Silhouette Selected Verbatim

L'impronta degli animali ha un doppio significato, impronta sull'asfalto anche. L'impatto è forte, ma è lasciato all'immaginazione (Greek Woman)

È reale, l'estinzione degli orsi dipende anche da noi. Le pubblicità le vedono tutti, anche i bambini, forse è un po' forte. (Italian Woman)

Stile CSI, scena del crimine (Italian Woman)

Impatto forte, da lontano vedevo sagoma, ho provato pena, da qui passano gli orsi devo stare attenta (Spanish Woman)

La sagoma come quella della persona e la frenata è molto forte (Spanish Woman)

C'è già stato un incidente nella zona, mi fa stare attento perché pensi di poter viaggiare in quella strada, ma possono uscire animali allo stato brado, quindi non vai tranquillo col piede sull'acceleratore (Italian Man)

Mi lascia idea della morte, sentimentalmente negativo, fa riflettere sul senso di responsabilità alla guida, al posto dell'orso ci potrebbe essere un bambino (Italian Man)

Andavo troppo forte, devo stare più attento. Potrebbe esserci un animale che attraversa la strada a sorpresa, devo guardare non solo in carreggiata (Italian Man)

Impatto forte rispetto alle altre, migliore per frase abbinata all'immagine, lasciare un segno irreversibile (Romanian Man)

Da lontano non chiara, non mi fa effetto, è una sagoma di un orso e non si capisce bene cosa sia (Italian Woman)

È scritto di rallentare per non lasciare la vostra impronta, ma la sagoma non si vede tanto, mi lascia più indifferente, mi convince meno (Greek Man)

Pensando di vederla quando viaggio è poco visibile, non riesco a elaborare tutte le informazioni, non c'è tempo. Ok in metro in treno, ma non quando vai in auto veloce (Italian Man)

Orso polare bianco, sgommata sotto non si vede bene da lontano (Romanian Man)

3_Morgue

3_Morgue Creative Hypothesis has the worst EEG reaction. Visibility is not so bad, but all the communication objects are not well perceived.

- The main message is difficult to observe and understand from a distance. There are two main reasons for this: the focal point is a white triangle between the two feet and the 'speed' message is too small because it is on the tag hanging on the foot. Participants did not have the opportunity to read the label hanging on the foot that is the main message.
- A lot of attention ends up under feet: this phenomenon can be used in favour of communication by reversing the factors.
- To improve readability and visibility, it is advisable to move the text down and raise the figure so that attention is triangulated on the text and not on the white triangle. The V shape of the feet doesn't help the scanpath here either. In the second and third steps the indicators improve and from the hotspot you can see that all the details of the creativity have been observed except the message "It was going at 100 km per hour".
- The claim is smaller and the center of gravity is lowered and the shape of the V-shaped feet take the look out of the billboard.
- This creativity captures Attention from a distance, but it can't keep it high, probably due to the dark color of the background and therefore contrasted with the environment. This means that the scene has to be more attractive from a distance by illuminating, for example, the foot and paw better.

Language	3_ROMANIAN			
	1_ITALIAN	2_GREEK	3_ROMANIAN	4_SPANISH
3_Morgue				
Participants	X	V	V	V
Visibility FixTarget/FixTot	=	V	=	=
Fixations Duration	V	X	X	X
Attention	=	V	X	X
Learning	=	=	=	=
Evocative	=	X	V	=
Simplicity	V	V	=	=
Cognitive Relax	V	X	V	V

3_Morgue Selected Verbatim

Esagerato, si vede sia animale che persona morti, limite superato del doppio, ho dovuto leggere cosa diceva e questo mi ha distratto ancora di più. Siamo in una camera mortuaria (Greek Woman)

Ci ho messo un po' a vederla, ho visto il cartellino, non avevo notato la zampa dell'animale, potrebbe essere originale, ma non l'ho notata subito. (Spanish Woman)

Si capisce che è camera mortuaria, ma sulla velocità è meno efficace (Italian Man)

Mi ha fatto molta impressione il piede di un morto con la velocità, mi ha impressionato (Greek Woman)

Ci sono anche le persone non solo gli animali (Romanian Woman)

Fa riflettere, ti mette di fronte alla morte immediata, più d'impatto e ci pensi un attimo. Gli altri non mi fanno niente (Spanish Woman)

Si capisce che è zampa orso se hai visto gli altri cartelli, si capisce che è un animale. (Italian Woman)

C'è il cartellino, ci vuole un attimo, non solo la persona ma anche l'animale. (Spanish Woman)

C'è un piede sbagliato, non è chiara (Italian Man)

Evoca obitorio, immagine che salta abbastanza all'occhio, ma bisogna capire perché c'è la zampa, quindi non è immediata anche se bivalente (Romanian Man)

È molto d'impatto emotivo, non l'ho mai vista come immagine, le altre sono già viste, questa mi dà brutte sensazioni (Italian Woman)

Riporta il limite di velocità a 50 all'ora e poi che si muore entrambi (Spanish Man)

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