Synesthesia and hypnosis

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THE TEORY

Synesthesia

• WHAT'S SYNESTHESIA?
•Synesthesia is the faculty to see the stimulus of one sensorial modality in another one.

•TYPES
•We can find two types of synesthesia:
    •**Cognitive synesthesia-->**the stimulus are asociated to simbolic minds
    •**Basic synesthesia-------->**the stimulus of one sensorial modaluty are perceived in anhoter one.

•NEURAL BASIS OF SYNESTHESIA
•The PET images show us that when a synesthete look a grapheme or sound, the visual areas are actived. It make un belive that they can see really colors wich sounds or grapheme.

•EXPERIENCES
•When a synesthethe read a newspaper he don't see it in whrite and black, but he see a multicolor palette.

Hypnosis

• WHAT'S HYPNOSIS?
•Hypnosis is a special state of conciousness where the hypnoticed accept all orders of the hypnotist.

•POST-HYPNOTIC ALLUCINATION
•The stimulus we recived directly to the exterior by the sensory organs, like the electromacnetic waves, we call "Sensory Primary Stimulus".
•These stimulus provoke another subjetive types of stimulus, like color and music. We call to these one "Sensory Secondary Stimulus".
•It'sn necesari the primary one to provoque the secondary one.
•When apears a Sensory Secondary Stimulus witchout the Sensory Primary Stimulus is called "allucination".
•By means hypnosis we can provoke allucinations.

•HYPNOSIS OF COLOR
•By means hypnosis we can sugest the subjects to see colors. They have the allucination of color.
•To mesure it we can use a Stroop task.

•NEURAL BASIS OF HYPNOSIS OF COLOR
•When the subjects are sugested to see color in a PET machinne, whe can see that the neuronal areas of the colors are actived.
•It make us thinc that really they are seen the color.

Synesthesia and hypnosis

• We saw before that wen a synesthete look a grapheme, he can see too a color, and he see really because the color areas are actived.
•We saw too that when a hypnoticed subject is sugested to see a color, he can see really because the color areas in the brain are actived too.
•So that, if we can asociate the color to the grapheme in the hypnoticed subjects, we can provoke grapheme-color synesthesia in they.

PET Image of Perceptually Driven Color Activation in Highly Hypnotizable Subjects[a]
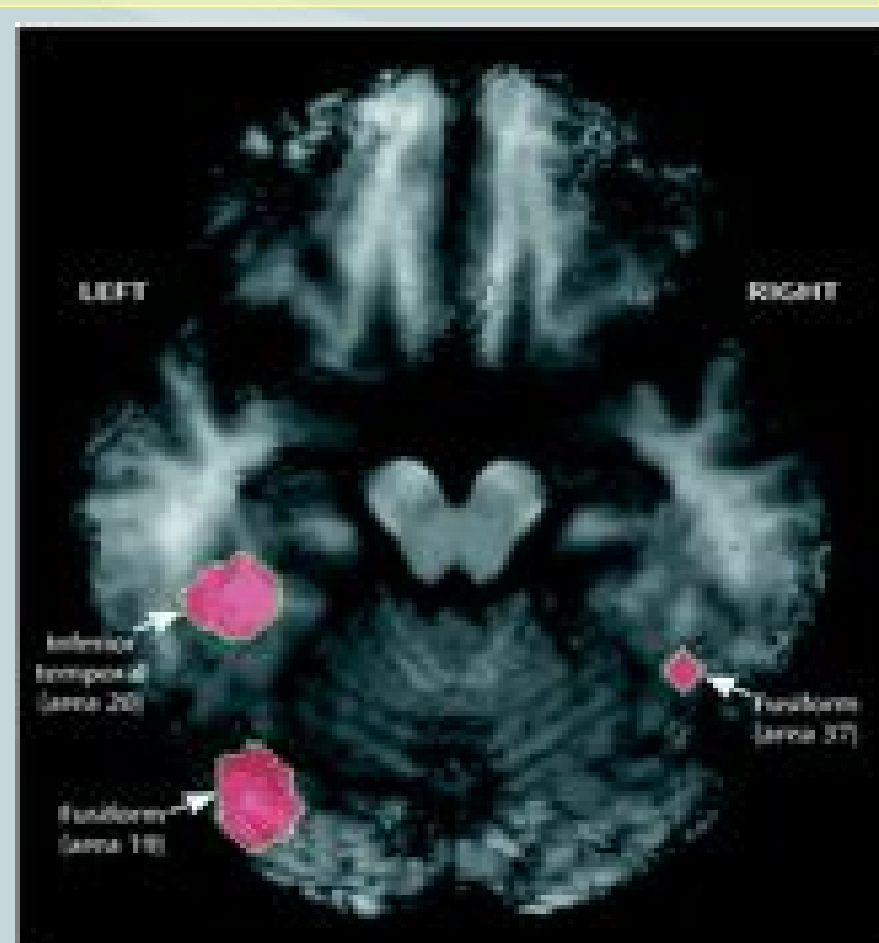
PET Image of Perceptually Driven Color Activation in synesthete Subjects[a]
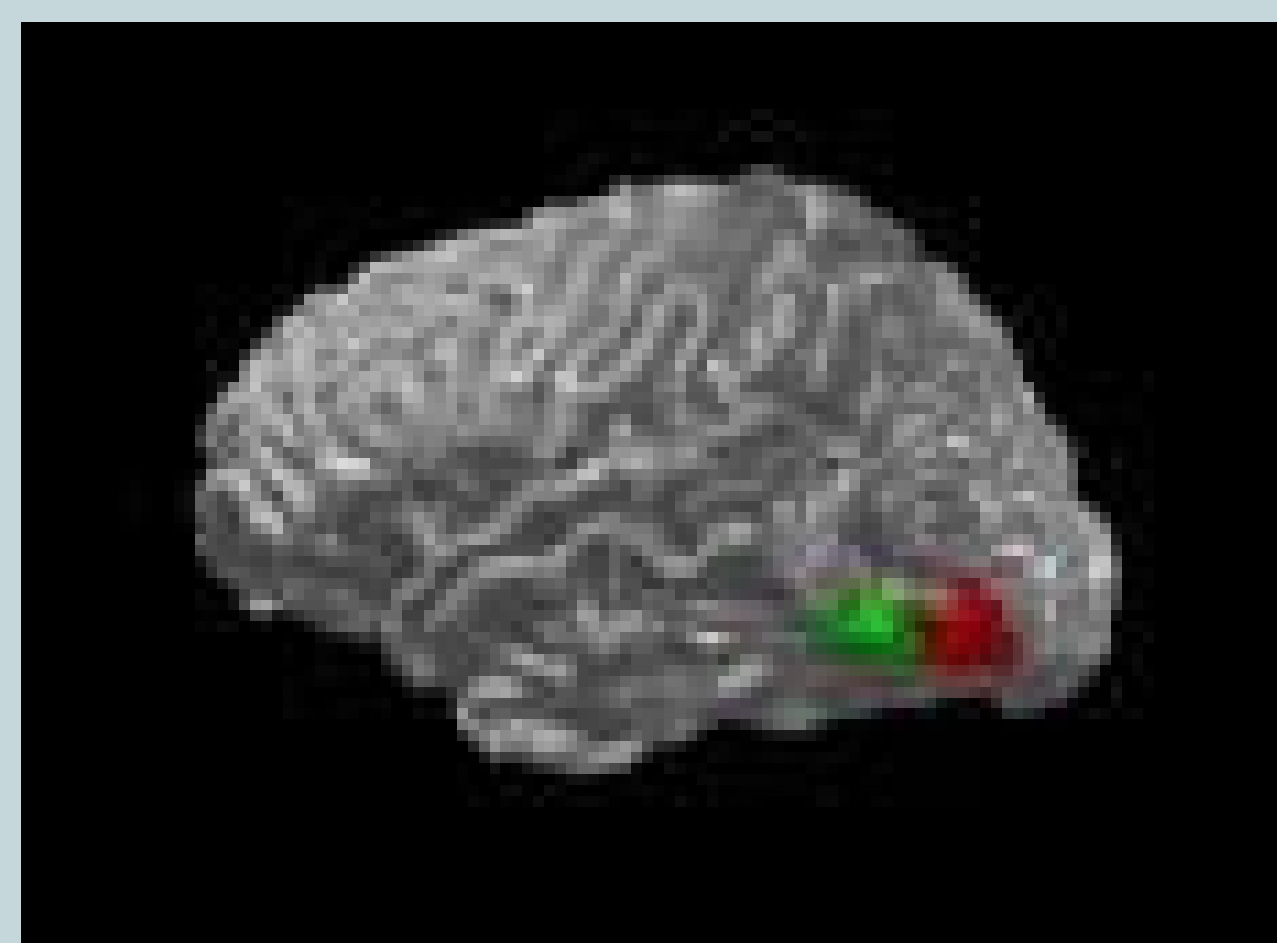
THE EXPERIMENT

Subjects

• We used a six volunteers subjects of the University of Granada.
•The ages are in the range os 33 to 19 years.

Material

•We used a special version of a Stroop task.
•The asociation we whants to implaint is:
•nº 1 is blue
•nº 2 is geen
•nº 3 is red
•In the first leaft are writed the numbers 1,2 and 3 in black and they are repeated 29 times. The subject must says the numbers as rapidly as possible in 45''.
•In the second leaft are writed the graphemes "XXX" printed in the colors blue, green and red. The subject must says the colors as rapidly as possible in 45''.
•In the third leaft are writed the numbers but this time in the colors blue, green and red. They are allways in a incongruent association. The subject must to say as rapidly as possible, first the numbers and after the colors.
•To know the susceptibility level we used the susceptibility scale of Martinez Perigot y Asis.
•We pass to a little questionary about the preferences in colors and numbers.

Method

•First we mesured the level of susceptivility. The tree subjets thas have more than 9 pounts in the susceptivility scare they were hipnoticed and they conform the experimental group.
•The another three subjects were not hypnoticed and conform the control group.
•Alls groups pass the questionary.
•The control group lerned the asociation and after they did the Stroop task.
•The experimental group were hypnoticed and sugest to see all nº 1 whitch a blue "aura", all nº 2 green and all nº 3 red. After that they did the Stroop task.

Results

• The ANOVA analisys show us that exist diferences between the control and experimental group in the quantity of colors they can says and the quantity of colored numbers they can says.
•In both cases the experimental group says lees items and in both cases the error probability of erros is lees than 0.001%.

•TABLE OF SULTS

	CONTROL				EXPERIMENTAL			
SUJETO	Nº	COLOR	Nº CON COLOR	COLOR CON Nº	Nº	COLOR	Nº CON COLOR	COLOR CON Nº
1	145	101	145	89	137	71	140	50
2	140	90	154	97	145	64	150	55
3	150	90	147	90	99	59	91	47
MEDIA	145	93,6	148,6	92	127	64,6	127	50,6
SUMA MEDIA	435	281	446	276	381	194	381	152
(SUM MED)*2	189225	78961	198916	76176	145161	37636	145161	23104
SUM MED*2	63125	26401	66350	25430	49595	12618	50381	7734

•COMPARATION GROUP X COLOR

FV	SC	GL	MC	F
EG	1261,5	1	1261,5	32,916
ERROR	153,3	4	38,325	
TOTAL	1414,83	5		

TEORICAL F
$_{0,95}F_{1,4}= 7,71$
$_{0,99}F_{1,4}= 21,20$

•COMPARATION GROUP X COLORED NUMBER

FV	SC	GL	MC	F
EG	2562,7	1	2562,7	144,99
ERROR	70,7	4	17,6	
TOTAL	2633,4	5		

Conclusions

•The data show us that the hypnoticed group have problems in says the colors they are seen, independently of if they are alone or they are in the numbers.
•Perhaps the association i did is in the two ways, not only interfear the number when the color is incongruent whitch it (the nº1 printed which red color is incongruent, the congruent is blue), but also interfear the grapheme "XXX". This grapheme is incongruent too because it is'n any number.