

## Attachment I – List of fMRI studies on irony

	Author	Title	Year	Study Design*	Hypothesis	Activated Brain regions
1	Akimoto et al.	Irony comprehension: social conceptual knowledge and emotional response.	2014	17F, 18M, 20.2, (18-23)	Conceptual knowledge of irony is represented by the anterior superior temporal gyrus representing social concepts	aSTG, situational context: MFC, aIFG; degree of irony: amygdala, hippocampus, parahipp.gyrus
2	Bosco et al.	Neural correlates underlying the comprehension of deceitful and ironic communicative intentions.	2017	9F, 14M, 22.7, (19-27)	Is TP, IFG, MFG, MTG or STG strongly activated in the comprehension of irony when compared to deceit?	left TPJ, left IFG, IMFG, left MTG, left DLPFC
3	Eviatara et al.	Brain correlates of discourse processing: An fMRI investigation of irony and conventional metaphor comprehension	2006	7F, 9M,	Does the processing of literal and nonliteral statements result in activation of the same brain areas? Will the distribution of activation be the same for two types of figurative language, irony and metaphor?	right STG, MTG
4	Filik et al.	What is the difference between irony and sarcasm? An fMRI study	2019	10F, 7F, 24, (19-29)	Are IFG and MFG activated more for sarcasm/irony, than literal statements?	IFG, mPFC
5	Herold et al.	Altered Neural Activity during Irony Comprehension in Unaffected First-Degree Relatives of Schizophrenia Patients-An fMRI Study	2018	7F, 5M, 37.00 ± 9.08, (26-55)	Altered comprehension of irony is a trait-like marker of liability to schizophrenia.	left DLPC, right IFG
6	Obert et al.	Neural Correlates of Contrast and Humor: Processing Common Features of Verbal Irony	2016	10F, 11M, 22.1, (20-27)	In connection to verbal irony comprehension, brains regions recruited by contrast would respond quadratically to humor	bilateral IFG, left caudate, left STG, STS, left lingual gyrus.

7	Rapp et al.	Neural correlates of irony comprehension: the role of schizotypal personality traits.	2010	15 F, 28, (21-52)	Is there a difference in brain regions involved in irony comprehension caused by schizotypal personality traits?	left MFG, left IPL
8	Rapp et al.	Isn't it ironic? Neural Correlates of Irony Comprehension in Schizophrenia	2013	15F, 28.1	Impairment in irony comprehension in both schizophrenia and autism may be caused by right hemisphere dysfunction. Dysfunction of the brain's frontotemporal language system may be crucial in the pathophysiology of the difficulties experienced by patients with schizophrenia in interpreting ironic remark	mTG, rolandic operculum, postcentral gyrus. LH insula
9	Shibata et al.	Neural substrates of irony comprehension: A functional MRI study.	2010	3F, 10M, 23.8, (20-29)	Are neural substrates activated in ironical sentences comprehension different from those activated in comprehension of literal sentences?	right mPFC, left precuneus, left STS, STG, PG
10	Spotorno et al.	Neural evidence that utterance-processing entails mentalizing: the case of irony.	2012	12F, 8M, 22	Is the ToM network involved in the on-line processing of ironic utterances?	mPFC, bilateral IFG - triangular and orbitalis parts, left insula, bilateral TPJ
11	Varga et al.	Irony comprehension and context processing in schizophrenia during remission – A functional MRI study	2013	14F, 10M, 33.96 ± 8.51, (23–55)	Patients with schizophrenia perform worse and exhibit an abnormal brain activation pattern during irony comprehension.	left TPJ, posterior division of left MTG, right PCC/precuneus, left sFG, pars triangularis of left IFG
12	Wakusawa et al.	Comprehension of implicit meanings in social situations involving irony: a functional MRI study	2007	17 F, 21 M, 22,3 (18-38)	Intentional processing of implicit social meanings as irony and metaphor is reflected in task-dependent activation	right TP, mOFC
13	Wang et al.	Developmental changes in the neural basis of interpreting communicative intent	2006	Children: 6F, 6M, (9-14); Adults: 6F, 6M, 26.9 ± 3.5 years (23-33)	Scenarios involving irony comprehension elicit greater activity in right hemisphere and prefrontal regions than scenarios containing only literal speech.	mPFC, left IFG, bilateral FG, mOG, iTG, STG,

14	Wang et al.	Neural basis of irony comprehension in children with autism: the role of prosody and context.	2006	18M, 11.9 ± 2.3, (8.1–15.7)	Children with ASD use prosodic and contextual cues to interpret irony differently from typically developing children	mPFC, left IFG
15	Wang et al.	Reading affect in the face and voice: neural correlates of interpreting communicative intent in children and adolescents with autism spectrum disorders	2007	18M, 11.8 ± 1.9, (9–15)	Scenarios involving irony detection elicit greater activity in the medial prefrontal cortex and superior temporal gyrus than scenarios containing only literal utterances in typically developing children.	dorsal and ventral mPFC, bilateral STG
16	Williams et al.	Brain function differences in language processing in children and adults with autism	2013	Children: 2F, 12M, 12.5 ± 1.5; Adults: 1F, 11M, 21 ± 3.7	Subjects with autism differ from typically developing subjects in functional connectivity in language comprehension and irony	left MFG, left pars triangularis, left and right MTG, left pars opercularis (IFG)
17	Yang et al.	Figurative language processing after traumatic brain injury in adults: a preliminary study	2010	27.6 ± 7.05, (25–48)	Traumatic brain injury patients display decreased activation of the left inferior frontal gyrus in comparison with healthy controls	left IFG

\*Subjects (females, males, mean age ± standard deviation, age range)

## Attachment II – List of stimuli

Number	Condition	Statement	% - of correct identification
1	L	A woman gets the wrong dye at the hairdresser's. But she wants to be nice and says: What a great color.	88
2	T	An athlete injured his leg. He wins the gold medal with the run and says: That was a great race.	94
3	I	A housewife's cake is burned. The man wants to tease her with it and says: It's just as good as always.	88
4	T	A gardener is lying in a hammock. He worked hard all day long and says: Man, that is exhausting work.	75
5	L	A goalkeeper goes wrong - 0: 1. His coach wants to comfort him despite the mistake and says: That was simply untenable.	94
6	I	A little girl is disguised as a ghost. Her sister wants to tease her and says: Huuuuh, I'm so scared.	81
7	T	A girl throws the ball at a boy. He's having fun with the game and says: It's very funny.	94
8	L	A woman travels to the mountains. She only does this because she loves her husband so much. She says: Oh, I love skiing.	100
9	L	A student misses the lecture. In order not to turn the lecturer against himself, he says: What a shame, such an exciting topic.	88
10	I	The party is very boring. A woman is disappointed with lost time and says: What a great party.	81
11	I	A man has a bad hangover. He looks into his pathetic reflection and says: I really do lead a healthy life.	100
12	I	The juice was really sour. A man grimaces in disgust and says: Tastes pretty sweet.	75
13	L	An old woman wants to cross the street. Nobody helps. Nevertheless, she later says to her grandson: The youth of today are really nice.	75
14	T	A singer fails several times in concert. A listener does not hear the mistakes and says: What a talented artist.	88
15	L	A woman's red nail polish is way too bright. Her friend wants to comfort her and says: You should always use this color.	100
16	I	A painter gets mixed up in color. The customer complains about the work and says: That looks wonderful.	94
17	I	A man is honored. But his boss insulted him several times in the speech. The man says:	88

		Thank you for the wonderful words.	
18	L	An apprentice brings the wrong snack. The boss does not want to burden the boy and says: Hmm, that's delicious.	88
19	T	The weather is too bad for a barbecue. Still, the party will be great. The host says: What a wonderful day!	100
20	L	The new car is often broken. The owner tries to sell it again and says: This is really the greatest car I've ever had.	94
21	I	A woman travels to the mountains. It rains there for days and she breaks her leg. She says: Oh, I love skiing.	100
22	L	An athlete injured his leg. He wants to hide this from his mother and says: That was a great race.	100
23	T	A man is honored. His boss gives a funny and deeply grateful speech. The man says: Thank you for the wonderful words.	100
24	I	An old woman wants to cross the street. A man sees her but leaves her there. She says: The youth of today are really nice.	100
25	I	A goalkeeper goes wrong - 0: 1. A fan is mad about the stupid mistake and says: That was simply untenable.	63
26	T	A little girl is disguised as a ghost. Her little brother is really scared and says: Huuuuuh, I'm so scared.	94
27	I	The new car is often broken. The owner complains to the manufacturer and says: This is really the greatest car I've ever had.	100
28	L	A singer fails several times in concert. But a listener wants to be nice and says: What a talented artist.	88
29	T	The juice was really sour. A man is used to extreme tastes and says: Tastes pretty sweet.	75
30	I	A student misses the lecture. The subject doesn't interest him at all. He yawns and says: What a shame, such an exciting topic.	75
31	T	A housewife's cake is burned. The man doesn't even notice it and says: It's just as good as always.	81
32	I	A woman's red nail polish is way too bright. Her boyfriend wants to tease her and says: You should always use this color.	100
33	T	The party is very boring. But a woman talks to an old school friend and says: What a great party.	63
34	L	A gardener is lying in a hammock. He calls his wife at home, whines and says: Man, that is exhausting work.	94
35	L	A girl throws the ball at a boy. He doesn't like that, but wants to please her and says: It's very funny.	100

36	T	A man has a bad hangover. He usually does not drink and does a lot of sport. He says: I really do lead a healthy life.	88
37	I	An apprentice brings the wrong snack. The boss looks disgusted and says: Hmm, that's delicious.	81
38	T	A painter gets mixed up in color. The customer is surprised, loves the color and says: That looks wonderful.	94
39	L	The weather is too bad for a barbecue. But the host really wants to celebrate and says: What a wonderful day!	63
40	I	A woman gets the wrong dye at the hairdresser's. She gets very angry and says: What a great color.	100
41	L	The party is very boring. But a woman doesn't want to be rude and says: What a great party.	100
42	T	A goalkeeper goes wrong - 0: 1. A reporter sees action replay in slow motion and says: That was simply untenable.	81
43	I	An athlete injured his leg. He is annoyed by the severe pain and says: That was a great race.	88
44	T	A woman's red nail polish is way too bright. Her boyfriend thinks it's sexy and says: You should always use this color.	94
45	L	A man is honored. His boss gives an excruciatingly boring speech. The man says: Thank you for the wonderful words.	88
46	I	A gardener is lying in a hammock. Once again, he has nothing to do and says: Man, that is exhausting work.	100
47	T	An old woman wants to cross the street. A man takes her hand to help. She says: The youth of today are really nice.	100
48	T	A student misses the lecture. Because it was his favourite subject, of all things, he says: What a shame, such an exciting topic.	100
49	I	A singer fails several times in concert. A listener is disappointed and angry and says: What a talented artist.	93
50	I	A girl throws the ball at a boy. The hit hurts him, and he says: It's very funny.	81
51	T	A woman travels to the mountains. There is fresh snow there and the sun is shining. She says: Oh, I love skiing.	100
52	L	The juice was really sour. A man wants his friend to try it and says: Tastes pretty sweet.	94
53	T	A woman gets the wrong dye at the hairdresser's. She likes experiments and says: What a great color.	81
54	L	A little girl is disguised as a ghost. Her father wants to make her happy and says:	80

		Huuuuuh, I'm so scared.	
55	L	A housewife's cake is burned. The man doesn't want to offend her and says: It's just as good as always.	94
56	I	The weather is too bad for a barbecue. It is pouring rain and the host says: What a wonderful day!	100
57	T	An apprentice brings the wrong snack. The boss is happy about the surprise and says: Hmm, that's delicious	81
58	L	A painter gets mixed up in color. But the customer doesn't want to have an argument and says: That looks wonderful.	100
59	T	The new car is often broken. But it's very nice and very fast. The owner says: This is really the greatest car I've ever had.	75
60	L	A man has a bad hangover. He pretends to be okay with his boss. He says: I really do lead a healthy life.	100