

In *Brain, Mind, and Social Factors* by Nina Slanevskaya, St.Petersburg, Centre for Interdisciplinary Neuroscience, 2012, pp. 87-90

### *3.4. Cognition based on comparative and critical thinking*

Cognition is a form of human mental existence. Man never stops to know new things and to learn new skills. Cognition could not be possible without comparative and critical abilities. However, what can we see in our real life? Political protesters are sent to prison for criticizing huge inequality of incomes and corruptive governments. Meanwhile, it is their human nature to compare, criticize, and make moral assessments according to inborn moral values. It is also their human nature that forces people to fight for free education

accessible for all because cognition is as necessary for mental survival as food for a body. The problem is that socio-politico-economic systems are mostly built on the basis of human biological needs ignoring the nature of human mentality.

What are inborn human neuronal mechanisms involved in comparative and critical thinking?

(1) Mirror neurons.

At the beginning of the 1990s, Rizzolatti and his colleagues discovered a special class of neurons in the frontal cortex of the macaque monkey, which got activated when monkeys observed the actions of an experimenter who manipulated with objects (Rizzolatti et al., 1996). These neurons were called mirror neurons because they mirrored the observed actions at the neuronal level. Later, the other areas of mirror neurons were found in the brain. Our mirror neurons are involved in observing movements and emotions of other people, and this reaction is automatic (Hass-Cohen, 2008; Buccino et al., 2004). If someone eats something sour and winces, an observing person involuntarily winces. Even the diminishing pupil size is mirrored by the observer's own pupil size (Harrison, Singer, Rotshtein, Dolan, Critchley, 2006). Ramachandran asserts that the significance of the discovery of mirror neurons for psychology is equal to the discovery of DNA for biology: the mirror neurons can provide the uniform framework for the explanation of many mental operations and capabilities, which have been inexplicable so far (Ramachandran, 2000).

While mirror neurons help us to copy movements and acquire new skills, our empathic reaction, and the Theory of Mind play an important role in social communication.

(2) Empathic reaction and the Theory of Mind.

The Theory of Mind (ToM) is a human ability to guess what the other man thinks and feels in certain circumstances (Christian, 2008; Frith, C.D., Frith, U., 1999). Meanwhile, the empathic reaction is a human ability to feel what the other feels (Christian, 2008; Gallese, 2003; Botvinick, Jha, Bylsma, Fabian, Solomon, Prkachin, 2005; Singer, Frith, 2005). Both the abilities are inborn, automatic, and unconscious. Many processes and neuronal networks engaged in ToM are similar to those that form the emphatic reaction, though there are some peculiarities.

Analysing the literature on empathy and Theory of Mind Matthew Lieberman and Tania Singer points out two main hypotheses (Lieberman, 2007; Singer, 2006):

(1) empathy and ToM must have some neuronal mechanism; our own experience is the basis for both the empathic reaction and the construction of the Theory of Mind. It could be impossible to understand other people without our own experience;

(2) empathy and ToM are based on mirror neurons. It is the mirror neurons which provide us with the ability of automatic reflection of mental and emotional states of observed people (Gallese, Goldman, 1998).

The neuroscientists supporting the first hypothesis object to the neuroscientists supporting the second hypothesis saying that imitation can take place without understanding, and that, perhaps, mirror neurons play an important role only in nonverbal communication (gestures, the expression of the face, the position of the body).

Unfortunately, as Singer remarks, the discovery of mirror neurons does not answer the question what is the mechanism of the transition of the other's sensory experience into our sensory experience without the irritation of peripheral neurons that transmit the command

to the brain about sensory stimulation (mirror neurons) (Singer, 2006). Or how can someone's feeling of sadness transfer into our knowledge of it if we are not sad at all (empathic reaction)? Or how can psychopaths easily guess the intention of the other one and know about the feelings and emotions of the other one without feeling the same by themselves (Theory of Mind)? What are the mechanisms?

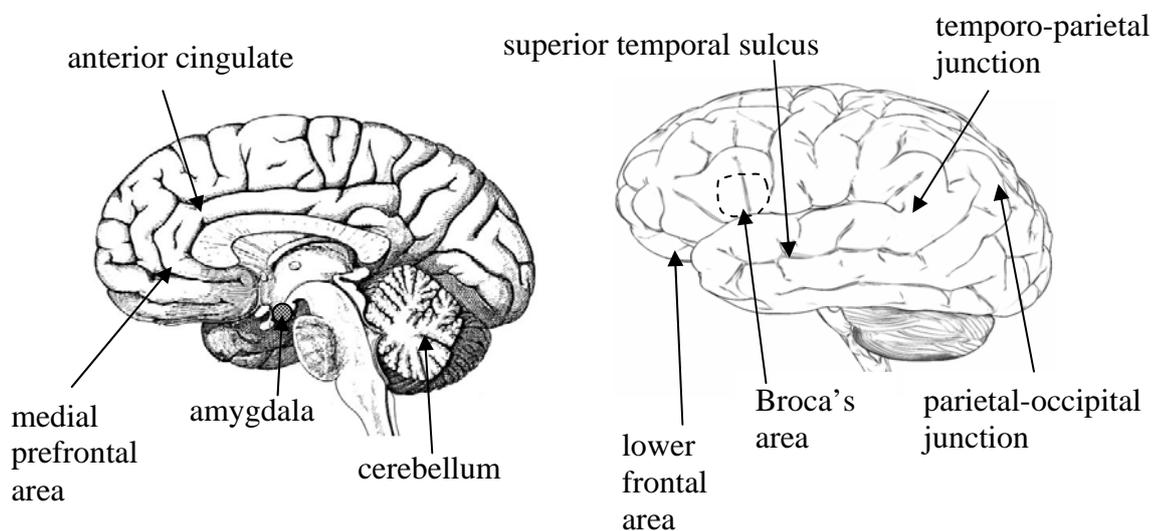


Fig. 11. The areas of the brain involved in the Theory of Mind (ToM).<sup>1</sup>

The following areas of the brain are involved in ToM: superior temporal sulcus, lower frontal area, medial prefrontal area, anterior cingulate gyrus, Broca's area in the left frontal lobe, the junction between the temporal and parietal lobes, the junction between the occipital and parietal lobes, amygdala (within the temporal lobe), cerebellum, and mirror neurons.

Many neuroscientists agree that the following brain structures participate in ToM: superior temporal sulcus, anterior cingulate gyrus, parietal cortex and prefrontal cortex (Brune, Brune-Cohrs, 2006). It was discovered that four-year-old children begin to understand and predict what the other child can think due to the Theory of Mind (Frith, C.D., Frith, U., 1999). If a child does not want to give his toy to his brother, or sister, he will hide it while they are out. However, children who suffer from autism can create ToM only at the age of 8-12.

Samson and colleagues distinguish two phases in ToM (Samson et al., 2005):

- (1) the ability of blocking your own perspective and experience;
- (2) the ability to guess other's perspective.

Rebecca Richell and her colleagues point out that neuroscientists try to answer the question whether the worse ToM leads to aggressive behaviour and psychopathy because the person cannot understand what the other one thinks (ToM is bad), or because he cannot feel what the other one feels (empathic reaction is bad) (Richell et al., 2003). Richell and her colleagues have arrived at the conclusion that ToM of psychopaths is not damaged, but they use different neuronal architecture than non-psychopaths, thus their psychopathic behaviour must be explained by something else (Richell et al., 2003).

<sup>1</sup> based on the description by Christian, 2008: 73-74

However, whatever achievements in neuroscience may be Tania Singer reminds us again that we cannot answer the main question how we transform what we see (visual experience) into ToM, and how our knowledge transforms further into what we should do and into motor commands and movements (Singer, Fehr, 2005). What are the mechanisms?

Perhaps, this question can be partially answered if we take *a dualist position* and admit the existence and interaction of two substances: mental and biological (material). In this case, the neuronal activation in the brain of an observing man is the result of *the preceding mental interaction of two mental substances of the observing and observed men*.

*Summary:* Our cognition is based on critical and comparative thinking which is reflected in neurophysiological processes: ToM, mirror neurons, empathic reaction. We cannot but compare everything all the time in order to understand and critically evaluate human behaviour and circumstances. The desire to learn, to criticize, and to compare is inborn. Here are some examples, which prove that it is true.

#### - Great Britain

In Great Britain there was a series of students' demonstrations in 2010-2011. It was a mass protest against the rise of tuition fees from £3,290 to £9,000 per a year, with wealthier graduates paying slightly more interest on their loans (News: Thousands of students storm Tory HQ in protest at tuition fees rise, 2010). The first main demonstration took place on 10 November in 2010, and it was jointly organised by the National Union of Students (NUS), which unites 95% of all students' unions of higher education in Great Britain (more than 7 million) and by the Trade Union of teachers of universities and colleges (UCU). Approximately up to 50 thousand students from all parts of Great Britain participated in this protest action (News: Students protest over fees turns violent, 2010). Teachers also joined the demonstration because they were against the decision of the government to cut down salaries and the expenditure on research. At first it was a peaceful demonstration, but after the Parliament passed the undesirable law, protesters stormed the Conservative Party headquarters, smashing windows.

At the demonstrations of 2010, students wanted to press for both anti-fees and anti-arts cuts statements saying that "Higher education teaching is in effect taken out of the domain of public policy and becomes an entirely private matter between individuals and institutions, with the market playing a much greater role than at present..."; "Although funding is withdrawn from all subjects, the fact that funding is withdrawn in totality from arts, humanities, social sciences and other classroom based subjects gives the impression that these areas which are so vital to the well being of society are not valued by Government..." (News: Student protests – as they happened, 2010).

Sally Hunt, the general secretary of UCU, said that the decision of the government about the rise of fees would be "the final nail in the coffin of affordable university education and the end of genuine choice of degree for thousands of people. The rest of the world is investing in education yet we're doing the opposite" (News: Killing affordable university education: Degree costs triple in two decades, 2010), and that the rise of fees for education and at the same time "slashing taxes for big businesses whilst telling the public we're all in

this together exposes the government's true agenda" (News: London: Thousands of students to march in protest over fees rise, 2010).

Aaron Porter, the president of NUS declared, "We will fight back against attempts to dismantle the funded education system we desperately need for economic recovery, social mobility, and cultural enrichment. The Government's short-sighted and self-defeating cuts to colleges and universities must be resisted and that resistance begins now" (Porter, NUS, 2011). On the website of NUS there are three principles of the Union: *equality, democracy and collectivism*. The ideal for the majority of people has not changed since the time of the French revolution in 1789: "Liberté, Égalité, Fraternité" because *these things are inborn human moral values of social organization*.

However, the education law was not amended after the protests, and a year later, in 2011, the government was prepared much better to suppress the students' protest action: "the police had warned they might use plastic bullets in 'extreme circumstances'" and "every side street was blocked, with horses, dogs and helicopters deployed alongside the ranks of police" (News: Thousands march in student protest over university fees, 2011). Jones (Metropolitan Police Authority watchdog) said, "The prospect of the police shooting at unarmed demonstrators with any kind of bullet is frankly appalling, un-British and reminiscent of scenes currently being used by murderous dictatorships in the Middle East" (News: London tuition fees protest: Rubber bullets 'available', 2011).

- Chile

In Chile, young people also struggle for their cognitive human needs with the power. However, they are met with tear gas and water cannons (News: Chile student protests point to deep discontent, 2011). The 2011-2013 Chilean protests are known as the Chilean Education Conflict. It was a series of students' protests across Chile demanding a radical overhaul of education system. The protests also reflected a deep discontent among some parts of society: other groups of population joined students in protest actions (News: Thousands of Chileans Protest for Education, Labor Reforms, 2011). The protesters demanded free education, constitutional reform, improved pension provision, new labour laws and corporate tax increases to pay for education and health (News: Chile strike: Clashes mar anti-government protest, 2011). The Chilean long-standing educational voucher plan began in 1980 under the Pinochet military government as part of an overall free-market and de-governmentalization package (Carnoy, 2002). However, the international experience shows, as Martin Carnoy sums up, voucher plans have increased the educational gap between the privileged and the underprivileged without making school better (Carnoy, 2002).

Waissbluth, a Chilean professor, describes the Chilean socially divided education system as "educational apartheid" and says that it lies at the heart of the current unrest, meanwhile, Brunner, former government minister, thinks that Chile is paying the price for introducing a radical free market model pervading every aspect of life including education and health as it is in the USA (News: Chile student protests point to deep discontent, 2011). It is interesting that under the president Sebastian Pinera, a Harvard-trained economist and billionaire investor, the economy grew 8.4 percent, the fastest pace since 1995. However, the protesters shouted slogans comparing Pinera with the military dictator Augusto Pinochet and declared, "Our main goal is to change this neoliberal capitalism. We're not just fighting for student rights, but those of the workers as well" (News:

Thousands of Chileans Protest for Education, Labor Reforms, 2011). The demonstrations in August of 2011 might be the biggest protest since the military government of Augusto Pinochet ended in 1990 (News: Thousands of Chileans Protest for Education, Labor Reforms, 2011). “It’s time to change the political system, the economic system, so there is a fairer redistribution of power and of wealth,” said student leader Camila Vallejo, “All this development model has done is make a few grossly rich” (News: Chile strike: Clashes mar anti-government protest, 2011).

People dislike a market model penetrating the important spheres of social life and consider it cruel and inhuman as much as Pinochet’s dictatorship. Pinera’s economic achievements are less important for people than fairness and equality in the society. *Inequality and unfairness are unbearable for the inborn human moral thinking* and cause social conflicts and fights.

The finance minister Felipe Larrain said that the government estimated the national strike would cost \$200 billion, with a loss of \$200 million each day. However, Javier San Martin, a protester and university student, is worried more about the lies on the part of the government and equal possibility for the satisfaction of cognitive needs, “It’s said there’s no money, which is a lie because the state has resources,” “it’s important to nationalize copper, which is our principal source of revenue. That would allow us to guarantee quality education for everyone” (News: Thousands of Chileans Protest for Education, Labor Reforms, 2011).

How can we find out what people truly need in order to avoid social conflicts? I suppose, it can be done by analyzing:

- (1) neuroscience data (the work of mirror neurons, ToM, empathy, inborn moral values with fairness and equality as basic ones for peaceful social life;
- (2) the history of the development of social conflicts caused by a particular socio-politico-economic structure;
- (3) the demands expressed by people participating in these conflicts.

What is a fair educational system for the Chilean students? What do they exactly demand in this sphere?

The students in Chile put forward the following demands:

1. Free education funded by the state at all levels and equal opportunity to have good higher education independent from families’ incomes. Higher education of young people from poor families will help to overcome the inequality gap in the country.
2. The law must be passed against getting any profit in education. There must be no market principles in this sphere. Education must be considered as a public good and social investment, but not merely as an individual’s benefit. Education is a human right and it must be guaranteed by the Constitution.
3. The higher education must be recognized by the State as the foundation for the social, cultural, educational, humanistic, economic, scientific and technological development. The national plan must be worked out in order to attract talented teachers by raising their status and salary.
4. The right of taking decisions in the educational sphere must belong to the society, which will define the educational policies independent from any current government.

5. Education must be pluralistic. There must be a free public access to sources of information and knowledge, enabling a comprehensive and critical treatment of issues with a diversity of opinions, visions, and disciplines. The generation and transmission of knowledge in public institutions must exclude any dogmatic and indoctrinating practices. Education must be based on such values as solidarity, tolerance, equality, social fairness, and the protection of environment, identity, and cultural and historical roots of the society. Education must create as many critically minded people engaged in intellectual work as possible (News: Bases para un acuerdo social por la educación chilena, 2011).

What do people in Russia want in the sphere of education?

Nowadays there is a tendency of pushing market principles in all spheres of life in Russia, so angry Russian parents expressed the following opinions about new educational reforms during the talk with L.N. Dukhanina, Deputy Chairman of the Public Chamber Commission on Education and Science, 4 February, 2011 (News: What will happen with the Russian system of education? 2011):

*Participant A:* “ The President (Medvedev) assures us that we can sleep quietly and that the commercialization of secondary education is out of the question. However many headmasters of schools have already informed parents that evidently the list of free of charge subjects will include only 2 hours of Russian language, 2 hours of mathematics, 3 hours of physical training, and 3 hours of the basic knowledge of orthodox religion a week. The rest of subjects will be paid by parents. What will happen with the Russian system of education, which was considered one of the best in the world?”

*Participant B:* “In the 1960-70s at our schools there were various FREE GROUPS<sup>2</sup> for teaching children certain skills after obligatory school lessons: technical skills, humanities, art, sports, etc., according to their interests. And we had good results of such groups: achievements in sports, technology, industry. Scientists and engineers under socialism were well qualified and well-assessed and are well-assessed in the world. Children did not wander or sat doing nothing in the basements and staircases of the buildings or other dirty places, etc. There were no drug abusers and children did not sit with bottles of beer in the parks and gardens, did not inject themselves drugs. Isn't it wiser to spend money on the payment to teachers and instructors of pastime educational groups at schools and palaces of Culture involving small children and teenagers in the interesting pastime for symbolic payment than to spend money on the treatment of alcoholics, drug-abusers trying to reduce criminal violence?”

*Participant C:* The system of education created in the Soviet Union is worth paying attention to. Education must be obligatory and free. Otherwise, we will grow the army of illiterate morons.

*Participant D:* Is the basic knowledge of orthodox religion more important than native language or, maybe, more difficult than it or mathematics, and that's why it demands much more time?!!! Who needs the basic knowledge of orthodox religion!!!? In our country half the population belongs to other confessions!!! Spend better the time on history, literature, Russian language, and mathematics! Those who need this subject send their children to orthodox schools! I fully agree with “we will grow the army of illiterate

---

<sup>2</sup> All emotional punctuation and capital letters are preserved in translation.

morons”. Evidently our government wants to have such population! The herd of sheep, which is easy for management and cheap labour.

*Participant E:* If you wish good reforms for education, consult ordinary teachers. If the state wants interethnic wars, introduce lessons of orthodox religion. There are children both from orthodox and Muslim families at our schools. I cannot understand at what kind of educational system our state is oriented? American? Just have a look what is going on in their ordinary American schools which are not elite!

*Participant F:* Don't you think that education is the sphere in which you must invest so that you might have the results, but not to earn money on it, as it is done now, according to reforms? Is school a plant, or a commercial shop, or a market?

The mantras of free market are enforced on Russians by the government as previously the mantras of the Communist party. The majority of Russians supported Perestroika because they were against too much power of the Communist party, which seemed sometimes ridiculous, irritating, forbidding normal human desires of having a small business, trade, travelling, expressing opinion freely, but instead people lost all their gains of socialism. What we have achieved hardly balances what we have lost. To get back the best from socialism and to preserve the best from capitalism, we will need quite a different type of socio-politico-economic system. Unfortunately, it does not exist anywhere in the world so that we might simply copy it.

As they say, the best evidence is your own experience. So I want to speak about mine under socialism.

Some people can develop their own spiritual qualities due to the inborn curiosity, talent, will-power, but the majority needs a people-friendly system. If the state had not supplied me with free tickets to the Philharmonic halls to listen to classical music every month for 7 years when I was a schoolgirl both of a secondary school and music school, my mother, without higher education and a well-paid job, would have, perhaps, preferred to buy a new dress for herself or something else when she had extra money and I would have never known that the combination of wonderful sounds could be so beautiful and pleasant, and I wouldn't think now that opera and ballet theatres and art galleries are the best places for pastime. Under socialism, all schoolchildren went regularly to museums and picture galleries with their teachers at least once per three months. I was taught to play the piano at music school for symbolic money. I went to ballet classes at my secondary school, which were free for all children who wanted to dance. After the Music Teacher Training college, where I studied for 4 years receiving a state grant and paying no tuition fees, I studied at the University as a part-time student of Philology and worked as a music teacher at the same time because I had already two children, and a student's grant was not enough for the family. There were plenty of kindergartens where children could be taken care of while their mothers worked or studied. There were no tuition fees for higher education, and the day-time students received state grants if they passed exams. I had fully paid additional student holidays twice a year at my work for taking exams at the University. I defended my PhD in Political Science and passed all necessary examinations paying no fees at all. Education was free at all stages and for all people. The socialist state, indeed, encouraged young people to study and to get higher education, and made culture

affordable for all people irrespective of their family income because theatres and museums were state maintained.

Comparing the development of science in different countries and studying the volume of research publications at the different periods of time, the analysts of “Thomson Reuters” say that the influence of Russian science in the world is diminishing (News: Russia is expelled from the club of scientific powers, 2010). Now Russia is behind China. About 20 years ago before the collapse of the Soviet Union there were more research projects in the Soviet Union than in China, India, and Brazil altogether (News: Russia loses space after science, 2011).

For the first time the majority of Russians expressed the opinion that the suppression of the Putsch<sup>3</sup> (19-21 August 1991) was the tragedy for Russia as Levada-Centre tells us (News: Putsch as tragedy, 2011). Only 10% of Russians think now that the suppression of the supporters of the Communist party and socialism in August of 1991 was the victory of democracy (45 regions of Russia in 2011). According to another poll by Levada-Centre, 60% of Russians think that the inequality is admissible only if the gap between the rich and poor is not great (News: Richness and poverty in Russia, 2011), and 23% do not want any inequality of incomes. About 48% of Russians do not want to have billionaires in the country. The majority of Russians have negative attitude to both richness and the rich because of the suspicious way of getting the property in the 1990s and the violation of the principle of social fairness.

The German ‘Spiegel’ reports with the reference to the sociological poll carried out by Emnid Institute, the Bertelsmann Foundation, that 88% of Germans are against capitalism and want a new economic order because capitalism cares neither for a social equality in society, nor for the protection of the environment and careful use of resources (News: Neun von zehn Deutschen fordern neue Wirtschaftsordnung, 2010). Four out of five Germans believe that social relations, health and environmental conditions are more important than the accumulation of money and property. Two thirds of people do not expect that the economic recovery will also automatically increase their personal quality of life, and only one third believes in the positive role of market mechanisms.

*Summary:* People enjoy learning new things at any age. Mental activity makes them happy and healthy. Many pensioners say that it is a great pleasure to study (News: The second youth, 2011). If the brain works properly owing to the continuous process of intensive cognition, we do not need to spend so much money on the treatment of people suffering from various diseases because of “lazy” dying neurons. There is less violence and criminality caused by mental frustration. If a man’s mind is occupied with learning the new skills or the new subject he likes, he has no desire to take revenge on the society: his mind is busy with positive things and he is mentally satisfied.

Cognitive and creative needs govern human behaviour in many ways.

---

<sup>3</sup> The coup was prepared by the top officers of the Army, the KGB, and the higher officials of the Communist Party to preserve socialism; its defeat was followed by the subsequent transfer all power to the president of the Russian Federation Boris Yeltsin and the promotion of capitalism.

## References

- Botvinick, M., Jha, A.P., Bylsma, L.M., Fabian, S.A., Solomon, P.E., Prkachin, K.M. (2005) "Viewing Facial Expressions of Pain Engages Cortical Areas Involved in the Direct Experience of Pain" in *Neuroimage*, 25: 312-19.
- Brune, M., Brune-Cohrs, U. (2006) "Theory of Mind-evolution, Ontogeny, Brain Mechanism and Psychopathology" in *Neuroscience Biobehavioral Review*, 30(4): 437-455.
- Buccino, G., Binkofski, F., Riggio, L. (2004) "The Mirror Neuron System and Action Recognition" in *Brain and Language*, 89: 370-376.
- Christian, D. (2008) "The Cortex: Regulation of Sensory and Emotional Experience" in Noah Hass-Cohen and Richard Carr (eds.) *Art Therapy and Clinical Neuroscience*, London and Philadelphia, Jessica Kingsley Publishers: 62-75.
- Frith, C.D., Frith, U. (1999) "Interacting Minds: A Biological Basis" in *Science*, Vol. 286, No. 5445: 1692-1695.
- Gallese, V. (2003) "The Roots of Empathy: The Shared Manifold Hypothesis and the Neural Basis of Intersubjectivity" in *Psychopathology*, 36: 171-180.
- Gallese, V., Goldman, A. (1998) "Mirror Neurons and the Simulation Theory of Mind-Reading" in *Trends in Cognitive Sciences*, 2(12): 493-501.
- Harrison, N., Singer, T., Rotshtein, P., Dolan, R., Critchley, H. (2006) "Pupillary Contagion: Central Mechanisms Engaged in Sadness Processing" in *SCAN*, 1: 5-7.
- Hass-Cohen, N. (2008) "CREATE: Art Therapy Relational Neuroscience Principles (ATR-N)" in Noah Hass-Cohen and Richard Carr (eds.) *Art Therapy and Clinical Neuroscience*, London and Philadelphia, Jessica Kingsley Publishers: 283- 307.
- Lieberman, M. (2007) "Social Cognitive Neuroscience: A Review of Core Processes" in *The Annual Review of Psychology*, 58: 259-289.
- Lieberman, M.D. (2006) "Social Cognitive and Affective Neuroscience: When Opposites Attract. Editorial" in *SCAN* (2006) 1: 1.
- News: Bases para un acuerdo social por la educación chilena (2011) Bases para un acuerdo social para la educación chilena, *El Chileno*, August, 2011, <http://elchileno.cl/world/nacional/1071-bases-para-un-acuerdo-social-por-la-educacion-chilena-texto-completo.html>, retrieved 10.10.2013.
- News: Chile strike: Clashes mar anti-government protest (2011) Chile strike: Clashes mar anti-government protest, *BBC News*, 26.08.2011, <http://www.bbc.co.uk/news/world-latin-america-14677953>, retrieved 11.10.2013.
- News: Chile student protests point to deep discontent (2011) Chile student protests point to deep discontent, by Gideon Long, *BBC News*, Santiago, 11.08.2011, retrieved 11.10.2013, <http://www.bbc.co.uk/news/world-latin-america-14487555>.
- News: Killing affordable university education: Degree costs triple in two decades (2010) Killing affordable university education: Degree costs triple in two decades, 10.11.2010, <http://www.dailymail.co.uk/news/article-1328301/University-degree-costs-triple-decades.html#ixzz1pUYhqoQo>, retrieved 10.11.2010.

- News: London: Thousands of students to march in protest over fees rise (2010) London: Thousands of students to march in protest over fees rise, 10.11.2010, archive: citizens free press Ireland.com, <http://drugsinfonewlineireland.wordpress.com/2010/11/page/19/>, retrieved 07.10.2013.
- News: Neun von zehn Deutschen fordern neue Wirtschaftsordnung (2010) Neun von zehn Deutschen fordern neue Wirtschaftsordnung, in Spiegel, 18.08.2010, retrieved 07.10.2013, <http://www.spiegel.de/wirtschaft/soziales/umfrage-neun-von-zehn-deutschen-fordern-neue-wirtschaftsordnung-a-712524.html>.
- News: Richness and poverty in Russia (2011) Richness and poverty in Russia, 03.07.2011, <http://www.svobodanews.ru/content/article/24254074.html>, retrieved 03.07.2011 (the title translated from Russian).
- News: Russia loses space after science (2011) Russia loses space after science, by Ivan Preobrazhensky, Rosbalt, 25.08.2011, <http://www.rosbalt.ru/main/2011/08/25/883096.html>, retrieved 25.08.2011 (the title translated from Russian).
- News: Student protests – as they happened (2010) Student protests – as they happened, by Peter Walker, Jonathan Paige, 09.12.2010, retrieved 07.10.2013, <http://www.theguardian.com/education/blog/2010/dec/09/student-protests-live-coverage?INTCMP=SRCH>
- News: The second youth (2011) The second youth. Grandmothers and grandfathers occupied German universities, 26.11.2011, TV channel “NTV” <http://www.ntv.ru/novosti/246227/>, retrieved 26.11.2011 (the title translated from Russian).
- News: Thousands of Chileans Protest for Education, Labor Reforms (2011) Thousands of Chileans Protest for Education, Labor Reforms, by Randy Woods, Matt Craze, 25.08.2011, <http://www.webcitation.org/61DR8VcSb>, retrieved 11.10.2013
- News: What will happen with the Russian system of education? (2011) What will happen with the Russian system of education? Online Conference, Arguments and Facts, <http://www.aif.ru/onlineconf/5320>, retrieved 01.04.2012 (the title translated from Russian).
- Ramachandran, V.S. (2000) “Mirror Neurons and Imitation Learning as the Driving Force Behind “the Great Leap Forward” in *Human Evolution*, retrieved 02.01.2012, [http://edge.org/3rd\\_culture/ramachandran/ramachandran\\_index.html](http://edge.org/3rd_culture/ramachandran/ramachandran_index.html).
- Richell, R.A., Mitchell, D.G.V., Newman, C., Leonard, A., Baron-Cohen, S., Blair, R.J.R. (2003) “Theory of Mind and Psychopathy: Can Psychopathic Individuals Read the ‘Language of the Eyes’?” in *Neuropsychologia*, 41: 523-526.
- Rizzolatti, G., Fadiga, L., Gallese, V., Fogassi, L. (1996) “Premotor Cortex and the Recognition of Motor Actions” in *Cognitive Brain Research*, 3(2): 131-141.
- Rizzolatti, G., Fogassi, L., Gallese, V. (2006) “Mirrors in the Mind” in *Scientific American*, 295 (5): 54-61.
- Singer, T. (2006) “The Neuronal Basis and Ontogeny of Empathy and Mind Reading: Review of Literature and Implications for Future Research” in *Neuroscience and Biobehavioural Reviews*, 30: 855-863.
- Singer, T., Fehr, E. (2005) “The Neuroeconomics of Mind Reading and Empathy” in *Neuroscientific Foundations of Economic Decision-making, AEA Papers and Proceedings*, Vol. 95, No. 2: 340-345.