Topic: Empathy

2019-04-24

Article Discussed

Singer, T., & Tusche, A. (2014). Chapter 27 - Understanding Others: Brain Mechanisms of Theory of Mind and Empathy. In P. W. Glimcher & E. Fehr (Eds.), *Neuroeconomics (Second Edition)* (pp. 513–532). https://doi.org/10.1016/B978-0-12-416008-8.00027-9

Brief Summary

The article “Understanding Others: Brain Mechanisms of Theory of Mind and Empathy” discusses the recent concentration of the affective human brain that is innately social. Social neuroscience, a new field that focuses on the attempted understanding of the complex connections between environmental influences and the effect on behavior. The field also seeks to comprehend cognitive processes underlying conduct, such as facial expressions of fear, attractiveness, and trustworthiness. More research is being conducted on comprehending an individual’s beliefs, intentions, and feeling, as well as moral and social reasoning. Class discussion focused on moral dilemma tasks and game theory more heavily. The class tried to comprehend how we could make decisions when engaged in moral dilemmas, as we tried to understand what the more “moral” choice would be. We then discussed the distinctions between moral dilemma tasks and game theory. We also conversed whether other species possessed Theory of Mind. There was no clear consensus on the decision, though there are examples of each individual animal showing examples of Theory of Mind.

Two outstanding questions within the discussion were Questions 16 and 20. Question 16 asked of the importance of compassion within the social world. From that question, we gathered information that shows compassion is very important in fields such as healthcare, where the showing of care could lead to a better recovery in patients. Question 20 considered the implications of empathy and Theory of Mind when dealing with individuals diagnosed with psychopathy. From research, it states that psychopaths only show empathy when it would positively affect them, so they do not generally have a good Theory of Mind.

Though much effort was made to answer all questions, a few remained unanswered. A few questions were asked in order to gain more clarification such as Q4: “What is a unitary concept?” and Q15: “What classifies something as a “basic social ability” and what are some examples of these abilities?” Other questions were pondering related issues, such as Q8: “What are other applications of the effects of the James-Lange Theory?” and Q24: “Age-differences are talked about frequently in regard to “individual differences in the structural and functional characteristics of the late-maturing dorsolateral prefrontal cortex”, specifically regarding impulse control and decision making. Are there further differences with regard to other characteristics, such as gender or socio-economics?” The last question that was left

unanswered was Q12, a interrogative considering the implication: “Does left handedness, right handedness or/and ambidextrous change the outcome of the results? Do more right handed people click faster or left?”

Cognitive Process Neuroimaging Analysis

Neurosynth term: “Empathy.”

Top 5 Pubmed articles

Williams, B., Lau, R., Thornton, E., & Olney, L. S. (2017). The relationship between empathy and burnout - lessons for paramedics: a scoping review. *Psychology Research and Behavior Management*, *10*, 329–337. https://doi.org/10.2147/PRBM.S145810)

Han, J. L., & Pappas, T. N. (2018). A Review of Empathy, Its Importance, and Its Teaching in Surgical Training. *Journal of Surgical Education*, *75*(1), 88–94. https://doi.org/10.1016/j.jsurg.2017.06.035)

Chen, J. (2018). Empathy for Distress in Humans and Rodents. *Neuroscience Bulletin*, *34*(1), 216–236. https://doi.org/10.1007/s12264-017-0135-0)

Bloom, P. (2017). Empathy and Its Discontents. *Trends in Cognitive Sciences*, *21*(1), 24–31. https://doi.org/10.1016/j.tics.2016.11.004)

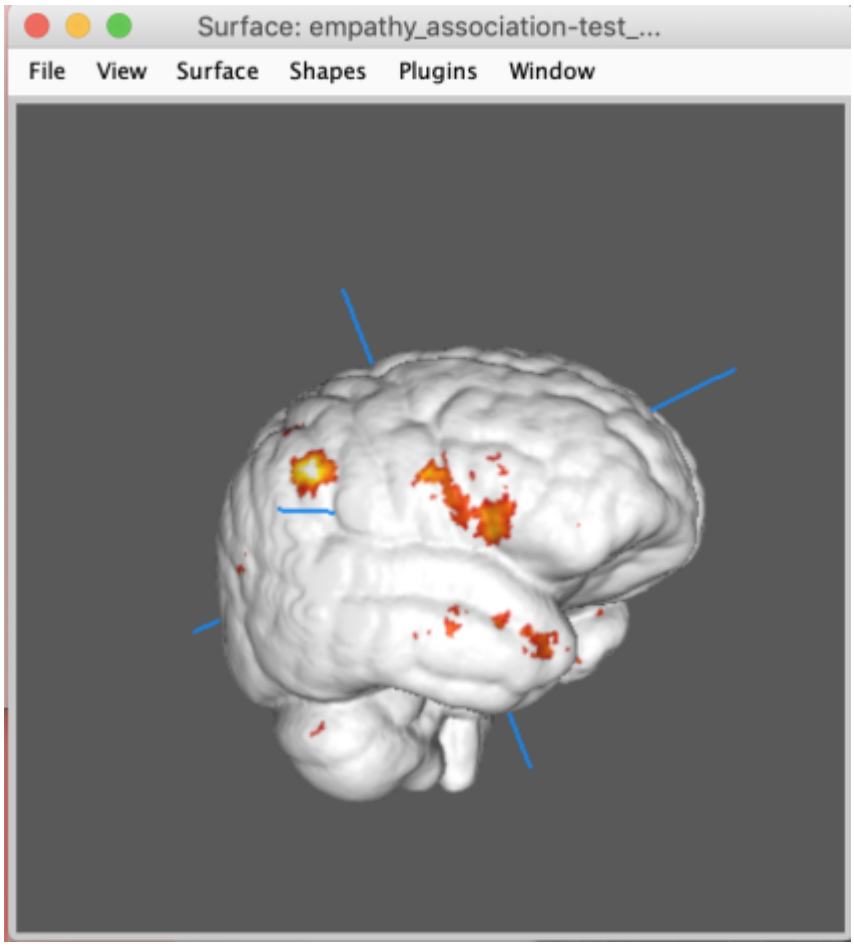
Sulzer, S. H., Feinstein, N. W., & Wendland, C. L. (2016). Assessing empathy development in medical education: a systematic review. *Medical Education*, *50*(3), 300–310. https://doi.org/10.1111/medu.12806)

Top 5 Neurosynth articles

Title	Authors	Journal	Loading
Is emotional contagion special? An fMRI study on neural systems for affective and cognitive empathy.	Nummenmaa L, Hirvonen J, Parkkola R, Hietanen JK	NeuroImage	0.715
How learning shapes the empathic brain.	Hein G, Engelmann JB, Vollberg MC, Tobler PN	Proceedings of the National Academy of Sciences of the United States of America	0.714
Interoceptive awareness enhances neural activity during empathy.	Ernst J, Northoff G, Boker H, Seifritz E, Grimm S	Human brain mapping	0.703
Multi-level comparison of empathy in schizophrenia: an fMRI study of a cartoon task.	Lee SJ, Kang do H, Kim CW, Gu BM, Park JY, Choi CH, Shin NY, Lee JM, Kwon JS	Psychiatry research	0.696

Neural activity related to cognitive and emotional empathy in post-traumatic stress disorder.	Mazza M, Tempesta D, Pino MC, Nigri A, Catalucci A, Guadagni V, Gallucci M, Iaria G, Ferrara M	Behavioural brain research	0.684

Neurosynth map for the term



Questions posed by the class

Clarifications and vocabulary

Q: Can someone explain the two graphs in figure 27.4?

ZeroCanary:

Study showed that soccer fans felt more empathic concern for an injured player on their favorite team (ingroup), compared to an injured player on the opposite team (outgroup). Empathic concern was reflected in neural responses in the anterior insula (AI), which predicts helping behavior. The decision to

refrain from helping an outgroup member was activated in the ventral striatum (nucleus accumbens, NAcc) when witnessing the other suffering. Basically the feeling of helping comes from AI and the resistance to help comes from the Nucleus Accumbens. This explains why the AI for ingroup members is high, and low for outgroup members.

Q: How does Galvanic Skin Conductance work?

CoolActive:

Galvanic Skin Conductance works by placing electrodes on areas with high density eccrine sweat glands (palms and soles of your foot) and sending small electrical charges through them.

(N.d.). Retrieved April 16, 2019, from //https://www.media.mit.edu/galvactivator/faq.html//

SodaOxford:

Galvanic Skin Conductance is measured by the change in sweat gland activity in response to a change in emotional state.

Farnsworth, B., & Ph.D. (2018, July 17). What is GSR (galvanic skin response) and how does it work? Retrieved April 16, 2019, from iMotions website: //https://imotions.com/blog/gsr///

Q: What does epistemological mean?

RavioliJaguar:

Epistemology, defined simply is the study of knowledge and justified beliefs. It is is concerned with the nature, scope and structure of knowledge. Epistemologists want to know first what knowledge is, and we want our analysis of the concept to guide us in determining the scope of knowledge, in deciding how much knowledge we have. In determining the scope of knowledge, epistemologist will attempt to answer sceptical challenges to the sources that are usually assumed to produce knowledge, sources such as perception, memory, testimony of others, and various kinds of reasoning. To describe something as epistemological is relating it to the study of the nature and origin of knowledge.

Goldman, A. (2004, March 1). EPISTEMOLOGY.

//https://doi.org/10.4324/9780203634233-7//

Hofer, B. K., & Pintrich, P. R. (1997). The Development of Epistemological Theories: Beliefs About Knowledge and Knowing and Their Relation to Learning. Review of Educational Research, 67(1), 88–140.

//https://doi.org/10.3102/00346543067001088//

Q: When the article states that theory of mind exists in apes but only in simpler forms, what are the simpler forms?

AmbientBenefit:

Using the referenced Povinelli and Bering (2002) article: “Evidence that human evolution was marked by the emergence of novel mental abilities is beginning to accumulate. There is increasing evidence that, at some point after hominids separated from the line leading to the modern African apes, humans developed a unique capacity to mentally represent a world of hidden causal forces, including mental states.” For example, the article states that “Although chimpanzees (apes) respond to eye gaze by following the visual trajectory of other individuals, even around barriers, they do not appear to grasp the fact that others’ visual behaviors are accompanied by the psychological experience of “seeing.” The article gives a couple other examples about how chimpanzees can understand properties of an object but not “unobservable causal forces.” (Povinelli & Bering, 2002)

Game theory and experimental tasks

Q: How does “Game Theory” contribute to our understanding of decision making and social interaction?

BanditMeter:

“many neurobiological studies have exploited game theory to probe the neural basis of decision making, and found that these unique features of social decision making might be reflected in the functions of brain areas involved in reward evaluation and reinforcement learning.” The Prisoner’s dilemma is a common game used to show people will often be less selfish and try to help the whole over just themselves and value social interaction.

Lee D. (2008). Game theory and neural basis of social decision making. Nature neuroscience, 11(4), 404–409. doi:10.1038/nn2065

Q: What would be an example of game theory being used in an individual’s daily life?

PoloBravo:

A great example of game theory in real life can be related to sports. In sports, everyone would be better off not using performance enhancing drugs and everything would also be on an even playing field. The issue is that when no one is using PEDs, a player gets the urge to use them to be better than everyone else, then they get an immense advantage over the other players. This leads to all players using PEDs and a player that does not use them will automatically be at a disadvantage.

Cazals, C. (2016, November 30). How Game Theory Affects Your Everyday Life. Retrieved April 16, 2019,

from The London Globalist website:
http://www.thelondonglobalist.org/how-game-theory-affects-your-everyday-life/

Q: What are some examples of moral dilemma tasks and the scenarios involved?

IsotopeNirvana:

“After the ship you are traveling with had an accident, you find yourself in a 10-person lifeboat together with 30 other people (men, women, and children of different ages). The lifeboat is too designed by Wimmer and Perner (1983) as an assessment of theory of mind abilities heavy to paddle and it is filling with water. Unless you throw some people overboard, the boat will sink killing everybody in it. What is the most morally acceptable choice?”

Q: Is game theory considered a moral dilemma task?

MileImport: Game theory is defined as “a branch of decision theory focusing on interactive decisions, applicable whenever the actions of two or more decision makers jointly determine an outcome that affects them all.” A moral dilemma task is defined as a situation in which a difficult choice has to be made between two courses of action, either of which entails transgressing a moral principle. With each of those definitions being noted, it is seen that game theory *can* be considered a moral dilemma task, but it is not *always* a moral dilemma task. Whether or not game theory is a moral dilemma task is entirely dependent on whether a decision transgresses a moral principle.

Q: What is the false-belief paradigm?

SincereZigzag:

Designed by Wimmer and Perner (1983) as an assessment of theory of mind abilities

In fact, children’s ability to infer that someone else believes that something is true when they themselves know it to be wrong is often taken as the ‘litmus test’ (Wellman, 1988) of theory of mind, but this preoccupation solely with the false belief paradigm has also been described as a kind of ‘neurotic task fixation’ by Gopnik, Slaughter and Meltzoff (1994, p. 157), who argue that other measures of theory of mind are also needed if we are to understand its origins and role in development.

Courtin, C., & Melot, A.-M. (2005). Metacognitive development of deaf children: lessons from the appearance–reality and false belief tasks. Developmental Science, 8(1), 16–25. https://doi.org/10.1111/j.1467-7687.2005.00389.x

Eliciting empathy in experiments

Q: Do you think the responses of the female and male partners in the empathic brain responses were different that it would be in a situation in which their partner was actually in pain? In this experiment, they knew their partner was not in any real pain or threatening situation.

SocialAnvil:

I think that in the scenario of the paper, the fact that they knew that their partner was not in pain definitely could have altered results. When you are in a stressful situation like that, there are many physiology responses that ensue as a result of being panicked. Also, it would be extremely difficult to test this because it would be unethical to actually subject someone to a painful experience. In the paper that I found, there was no sex differences in perspective taking, which is the primary index of cognitive, top-down empathy processes. However, there were differences in signals in a cluster in primary somatomotor cortex in females compared to males. This suggest that localized internal somatomotor representations of others' pain, a functional index of bottom-up resonance processes, are stronger in females. But, this finding doesn't mean that overall women are more empathic. I think that in this case the ability to have empathy is not different but instead, how the empathy is processed is different.

Christov-Moore, L., & Iacoboni, M. (2018). Sex differences in somatomotor representations of others' pain: A permutation-based analysis. Brain Structure and Function, 224(2), 937-947. doi:10.1007/s00429-018-1814-y

Alexithymia

Q: What does "Alexithymia is a subclinical phenomenon" mean? Is Alexithymia a genetic condition?

MobileSuper:

Alexithymia is a subclinical phenomenon involving a lack of emotional awareness or, more specifically, difficulty in identifying and describing feelings and in distinguishing feelings from the bodily sensations of emotional arousal

The inability to express emotions (alexithymia) is thought to be **hereditary**. While the results of this twins study suggested a moderate influence of shared environmental factors, the results are in concordance with the general finding that environmental influences on most psychological traits are primarily of the nonshared rather than the shared type.

[1] *Singer and Tusche, "Chapter 27 - Understanding Others."*

[2] *"Is The Inability To Express Emotions Hereditary?"*

Q: What brain regions are involved in someone with Alexithymia?

PolarisUnique:

“Early studies showed evidence that there may be an interhemispheric transfer deficit among people with alexithymia; that is, the emotional information from the right hemisphere of the brain is not being properly transferred to the language regions in the left hemisphere, as can be caused by a decreased corpus callosum, often present in psychiatric patients who have suffered severe childhood abuse. A neuropsychological study in 1997 indicated that alexithymia may be due to a disturbance to the right hemisphere of the brain, which is largely responsible for processing emotions. In addition, another neuropsychological model suggests that alexithymia may be related to a dysfunction of the anterior cingulate cortex. These studies have some shortcomings, however, and the empirical evidence about the neural mechanisms behind alexithymia remains inconclusive(“Alexithymia,” 2019).”

Alexithymia. (2019). In *Wikipedia*. Retrieved from

Theory of Mind

Q: The reference cited from 2002 said otherwise, but is there more recent research to show other species have a Theory of Mind, not only humans?

AmbientBenefit:

Some researchers have explored theory of mind in monkeys because of what they called “chimpocentrism” a.k.a. researchers only focusing on apes and humans and not including monkeys in these comparisons, because of apes theorized “superior mental abilities.” Using the gaze following test of theory of mind, some species of monkey were able to follow the experimenters gaze around barriers while others (and apes) were not. However, when the human experimenter was replaced with a “conspecific” (an animal of the same species) which improved abilities of all species to follow gaze. Another commonly tested component of theory of mind is perspective taking (object-choice tasks for humans and recently a “competitive feeding paradigm” for monkeys and apes, etc) shows mixed results on whether monkeys/apes can take the POV of another. (“conspecific - Wiktionary,” n.d.; Meunier, 2017)

Q: The article mentions that ToM changes in brain location during development, but is there a certain age that ToM first appears in children?

TelecomElegant:

Theory of Mind first appears and begins to develop between the ages of four and five (“Tuning In to Others: How Young Children Develop Theory of Mind,” n.d.). The actual timeline of development can be traced as certain skills are grasped. This article summarizes this order by the ability to understand

certain concepts, and the proposed order is as follows: “wanting”, “thinking”, “seeing leads to knowing”, “false beliefs”, “hidden feelings” (“Tuning In to Others: How Young Children Develop Theory of Mind,” n.d.).

Tuning In to Others: How Young Children Develop Theory of Mind. (n.d.). Retrieved April 16, 2019, from http://www.hanen.org/helpful-info/articles/tuning-in-to-others-how-young-children-develop.aspx

Compassion, psychopathy, and sociopathy

Q: Why does compassion matter in social settings?

One of the questions that was found interesting was the one that tackled the issue of why compassion matters in social settings. In one of the first articles I read, it was stated that in terms of clinical practice, medical research, and education, empathy was a more applicable construct. Compassion, in this article, is important because it focuses on the mutually reciprocating relationship between patient and healthcare professional, laying the foundation for the importance of compassion in the entire process. Although empathy is important, it is stated that compassion requires a higher level of suffering and understanding in the patient and the healthcare provider than empathy allows (Jeffrey, 2016).

It has also been shown that without the use of compassion within the rehabilitation process, the care given would be seen as almost robotic, as the level of personal engagement and connection to the patient would be decreased drastically, becoming almost unemotional (Kneafsey & Andrews, 2018). The importance of compassion is shown through the perspective of a patient who was being treated for cancer. In his story, he relates to how greatly cancer affected him negatively, but with the care and consideration of his doctors and nurses, he regained the strength to not give in to his desire to commit suicide. Stories such as this show how vital the use of empathy and consideration is to the life of a patient who is suffering (Barbor, 2018).

All this information seems to direct us to the answer of why compassion is important. While these articles have focused on its importance in the healthcare field, it can be easily transferred into other career fields or just in social life. The higher level of your compassion, the better chance you have of relating to the people you are dealing with. This is crucial in any kind of customer service industry. This is also vital information for anyone in a leadership position, as compassion will allow those under you to see that you care for their sakes, not just your own.

Works Cited:

Barbor, M. (2018). The Importance of Compassion: Perspective from a Lifelong Patient. Oncology Nurse-APN/PA, 11(3), 12–12.

Jeffrey, D. (2016). Empathy, sympathy and compassion in healthcare: Is there a problem? Is there a difference? Does it matter? Journal of the Royal Society of Medicine, 109(12), 446–452.

https://doi.org/10.1177/0141076816680120

Kneafsey, R., & Andrews, H. (2018). Nurturing and supporting compassion. Journal of the Australasian

Rehabilitation Nurses' Association (JARNA), 21(3), 3–5.

RespondLlama:

"The empirical nature of compassion is not well understood, it involves the presence of suffering and a desire to relieve it in a dynamic relationship which may change over time. There is a debate as to whether it can be nurtured or is simply an innate quality of the person." This article says that compassion is most important when someone is going through a difficult time because another person will not only feel the emotions of the individual but desire to do something to change them.

Jeffrey, D. (2016). Empathy, sympathy and compassion in healthcare: Is there a problem? Is there a difference? Does it matter? Journal of the Royal Society of Medicine, 109(12), 446–452. //https://doi.org/10.1177/0141076816680120//

Q: Why do some people, like psychopaths, totally lack empathy (but still have good Theory of Mind)?

It is important in tackling this question that we investigate it section by section before considering the whole. The first section we must look at is the question as to why some people, such as those diagnosed with psychopathy, seem to lack emotions. Rather than state "lack empathy," it would be better to say, "reduced empathy." There have been many who think that psychopaths lack the abilities to gain the average level of empathetic emotion. However, research seems to state that the reduced feelings felt are the result of lacking either the focus or the lack of connectedness rather than the lack of capability. Speculation is made by researchers that psychopaths can attend, identify, and understand others' emotions, but will not do so if undirected (Luckhurst, Hatfield, & Gelvin-Smith, 2017).

The final section we will take into consideration is Theory of Mind and what it means. ToM is the ability to socially and cognitively understand the actions of individuals that motivate behavior, such as beliefs, emotions, desires, and intentions (Wade et al., 2018) Research has shown that individuals with psychopathy have a lowered inclination to systematically consider another person's perspective. Findings have shown that psychopaths use a system of consideration in terms of something's conduciveness to their set of goals. This is discussing the tendency of a psychopath to take another person's perspective into account only when it is goal-conducive. This makes it extremely difficult to represent the perspective of others in a "nongoal-relevant situation" to a psychopath (Drayton, Santos, & Baskin-Sommers, 2018).

Due to this information, I believe that it should be noted that a person who is inflicted with "reduced empathy" does not possess the cognitive ability to have a good Theory of Mind.

Works Cited

Drayton, L. A., Santos, L. R., & Baskin-Sommers, A. (2018). Psychopaths fail to automatically take the perspective of others. Proceedings of the National Academy of Sciences, 115(13), 3302–3307. https://doi.org/10.1073/pnas.1721903115

Luckhurst, C., Hatfield, E., & Gelvin-Smith, C. (2017). Capacity for Empathy and Emotional Contagion in Those With Psychopathic Personalities. Interpersona, 11(1), 70–91.

https://doi.org/10.5964/ijpr.v11i1.247

Wade, M., Prime, H., Jenkins, J. M., Yeates, K. O., Williams, T., & Lee, K. (2018). On the relation between theory of mind and executive functioning: A developmental cognitive neuroscience perspective. Psychonomic Bulletin & Review, 25(6), 2119–2140. https://doi.org/10.3758/s13423-018-1459-0

AmbientBenefit:

Plot twist, they actually might have bad theory of mind. A recent study from 2018 looks at whether or not psychopathic tendencies are rooted in a cognitive deficit ("specifically an inability to take others perspective") instead of a social-affective processing deficit. They use "automatic" ToM tasks instead of "controlled." From the Drayton, Santos & Baskin-Sommers (2018) article because I couldn't figure out a way to say it better: "Controlled ToM processes are engaged when an individual intentionally considers the perspective of another person, whereas automatic ToM processes are engaged when an individual unintentionally represents the perspective of another person. In a sample of incarcerated offenders, we find that psychopathic individuals are equally likely to show response interference under conditions of controlled ToM, but lack a common signature of automatic ToM known as altercentric interference. We also demonstrate that the magnitude of this dysfunction in altercentric interference is correlated with real-world callous behaviors (i.e., number of assault charges). These findings suggest that psychopathic individuals have a diminished propensity to automatically think from another's perspective, which may be the cognitive root of their deficits in social functioning and moral behavior." (Drayton, Santos, & Baskin-Sommers, 2018)

Q: Do the brain structures and cognitive responses associated with empathy differ in psychopaths compared to those who have the ability to empathize?

DivideSegment:

The brain structures that are associated with empathy do not become activated, the right supramarginal gyrus. They have high empathy for pain for themselves, activating the anterior insula, right amygdala, and somatosensory cortex, however they lack the ability to put themselves in someone else's shoes. However, when imagining others in pain their ventral striatum began more active, an area that activates during pleasure.

The Neuroscience of Empathy. (n.d.). Retrieved April 16, 2019, from Psychology Today website: //http://www.psychologytoday.com/blog/the-athletes-way/201310/the-neuroscience-empathy//

https://en.wikipedia.org/w/index.php?title=Alexithymia&oldid=892056873

Q: Are psychopaths born without the ability to empathize with others or is it something they learn as they grow? Can psychopathy be prevented if it isn't something they are born with?

PaintLevel:

Psychopathology, or antisocial personality disorder (APD), is a personality disorder defined by “a pattern of irresponsible and antisocial behavior beginning in childhood or early adolescence and continuing into adulthood”. It is hypothesized that the symptoms of psychopathology are the result of the lack of a violence inhibition mechanism (VIM), an evolutionary mechanism found in animal models. Like most disorders, APD is the result of physiological, cognitive, behavioral, and social factors. Therefore, it can be concluded that the personality disorder could be either brought on or avoided under the right conditions.

Blair, R. J. R. (1995). A cognitive developmental approach to morality: investigating the psychopath. Cognition, 57(1), 1-29.

Q: Do fMRI studies show different readings in brain images related to empathy for sociopathic people compared to healthy people?

Optiontemple:

I didn’t see any studies where they used fMRI’s to calculate empathy studies have been done measuring responses that said there wasn’t much difference in healthy and sociopathic as far as empathy goes but there have been studies on empathy showing this is possible.

(Künecke, Mokros, Olderbak, & Wilhelm, 2018) (Vistoli, Lavoie, Sutliff, Jackson, & Achim, 2017)

Traning social intelligence

Q: Can social intelligence be trained to improve to a drastic degree or is it heavily seated in genetics?

VideoSport:

Like most forms of intelligence, both genetics and environmental learning impact social intelligence[3)]. Many schools, especially preschools, emphasize the importance of teaching children social intelligence and use methods such as play-based learning to help facilitate this type of growth. For example, they may “use pretend play to help children practice appropriately expressing… emotions. Teachers can guide children’s responses to pretend scenarios and model appropriate language and emotional expression”[4)]. Additionally, the ability to increase social intelligence does not end after childhood. Emotional intelligence (EI), a form of social intelligence, is one area that studies have demonstrated can be improved with training[5)]. One study of college students demonstrated that after participating in EI lessons throughout a semester students significantly improved their scores on EI tests from the beginning to the end of the semester compared to the control group [6)]). Older adults in the workplace have also been shown to have increased EI after participating in team-based learning activities[7)].

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