

# Key Identifiers of Pedophilia and Differences in Pedophile Brain Morphology: A Comparative Approach

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## Abstract

In the late 1800s to the early 1900s, pedophilia was considered a sexual perversion for weak minded people. With its official addition to the DSM-II (Diagnostic and Statistical Manual of Mental Disorders- II) in 1952, pedophilia began to be viewed by experts as a mental disorder. Within the past few decades, a collection of research has been devoted to gaining a better understanding of how pedophilia can be detected and what are its causes. Research concludes that the pedophilic brain is different from the brain of a healthy person in a few different aspects. This review first considers different methods for determining if a person has pedophilic tendencies such as IATs (Implicit Association Tests), phallogentric testing, and fMRIs (functional magnetic resonance imaging). Then this paper looks at identified differences in the pedophilic brain such as abnormalities in the frontal

cortex and the amount of gray and white mater. Lastly this paper outlines hormone treatment and its negative effect on pedophilic compulsions. With further understanding of pedophilia, better treatments, even cures can be produced.

*Keywords:* Pedophilia, White/Gray Matter, Testosterone, Frontal Cortex, Phallogentric Testing

When compared to schizophrenia, a well-researched disorder that affects 1 in 100 individuals, the prevalence of pedophilia is startling (Schizophrenia). Researchers speculate that approximately 1 – 5 out of every 100 men are pedophiles (Zarembo, par 9). Despite the high prevalence of pedophilia in the population, experts still know very little about the causes and cures for this condition.

Pedophilia is defined as being sexually aroused and attracted to children and

adolescents. One common misconception is that those who were sexually abused during their own childhood will become pedophiles; in reality, only about 1/3 of pedophiles reported a history of childhood sexual abuse (Zarembo, par 16). Another misconception is that by being a pedophile, a person will with certainty molest children, and anyone who molests children is a pedophile. However, pedophilia does not necessarily mean that the person has ever or has the intention of physical interactions with a child. Further, some people claim that pedophiles are merely attention addicts who choose children primarily because those relationships are forbidden or taboo (Zarembo).

Still, some experts such as psychiatrist Dr. Fred Berlin, agree that pedophiles experience the same level of desire for romantic and sexual relationships as a healthy person does with adults. These experts claim that pedophilia is a sexual orientation, rather than a desire to be socially deviant (Zarembo, par 12). Many pedophiles agree that their urges are morally wrong and wish that they could better control or eradicate their compulsions. Berlin claims that pedophiles are often “good people who are struggling... tortured souls fighting like heck not to do this. We do virtually nothing in terms of reaching out to these folks. We drive it underground”(Zarembo, par 10-12). Better understanding the causes of this condition will allow us to better treat, and perhaps even prevent pedophilia, rather than punishing pedophiles after they act on their compulsions.

Emerging research on pedophiles proves that pedophiles have a different brain morphology compared to a healthy person specifically in the frontal cortex and white and gray matter amounts. While the research does have its limitations such as small sampling sizes, the research is still a valuable tool for understanding pedophilia. Society ostracizes pedophiles and punishes them for their compulsions, instead of approaching pedophilia as a disorder in need of sound and viable treatments.

## What is the history of Pedophilia?

The concept of pedophilia is not a recent phenomenon; in fact behaviors of pedophilic nature have been identified in ancient Greece and the Roman Empire. The term pedophilia erotica was first used by Viennese psychiatrist Richard von Krafft-Ebing in 1886, where it was described as a “psycho-sexual perversion” (Ebing, 1892). Sigmund Freud (1905) briefly wrote about pedophilia in his book *Three Essays on the Theory of Sexuality*. In it, Freud claimed that pedophiles are weak people who cannot control their sexual urges enough to wait until another adult was available to occupy their attention and instead make “use of such substitutes” (pg 18-20). In 1908, Auguste Forel, a Swiss psychiatrist and neuroanatomist recognized a distinction of people with organic brain conditions who had compulsions towards children. Forel believed that these sexual urges were deeply rooted in the person’s psyche

and therefore unchangeable. In 1952, the term pedophilia was formally added to the Diagnostic and Statistical Manual of Mental Disorders (DSM)-II as a type of sexual deviation and was later given a full description in the DSM-III released in 1980.

Since its induction into the DSM, pedophilia has been the subject of countless research studies aimed at identifying the causes and effective treatments for the disorder. Recent research suggests that pedophilia is a biological condition rooting in neurological functioning (Cantor, 2008; Fromberger, 2013; Schiffer & Peschel, 2007; Schiffer & Paul, 2008; Schiffer & Vonlaufen, 2011; Walter, 2006). For instance, roughly 30% of all pedophiles are left-handed or ambidextrous, three times the prevalence in the general population. Experts argue that since hand dominance is developed through various gene combinations, the high prevalence of left-handedness is a strong indicator that some sort of dysfunction occurred while the person was in the womb. In a different study, researchers discovered that on average, pedophiles are almost an inch shorter and 10 IQ points lower than the general population (Zarembko, 18-20). This could indicate that pedophiles experienced developmental issues while in the womb or during infancy. This research has the potential to change the way society views people with pedophilia from being sexual deviants to having a diagnosable mental disorder.

## How can pedophilia be tested for?

### *How can the IAT be used to detect pedophilia?*

There are different ways that researchers can test a person for pedophilia; some being more time and expense costing than others. As technologies and our understanding of the condition improve, experts can begin to identify the most useful and cost effective types of tests. Recently, there are three types of tests used by researchers and law enforcement alike that can be used to identify someone as a pedophile. First is the IAT, or Implicit Association Test, which is to date the most accurate examination to identify pedophilia. When taking the IAT, a person is given various words and must place the words into different categories. The various categories include sexual words, non-sexual words, adult words, child words, and female words. The categories are paired together, for example, sexual words could be paired with either adult words or child words in order to create larger categories. Experts then measure the time it takes for the person being tested to categorize the words into their distinct groupings. People who are pedophiles responded quicker when sexual words and child words were paired together than when sexual words and adult words are paired. Healthy people responded faster to sexual words and adult word pairings. The IAT is far from perfect, and even though it can identify pedophiles with a 72% success rate, it will incorrectly label healthy people as pedophiles 42% of the time (Gray, 2005). Researchers speculate that the some of the incorrect identification can be

attributed to the fact that the test does not account for any traumas that the person faced during childhood, such as sexual abuse; which could create a connection between sexual words and child words. The incorrect labels could potentially be caused by men who were currently attempting to conceive children, which would explain, even subconsciously, the tie between sexual words and child words. (Gray, 2005). As research continues, the IAT can evolve to encompass and account for external factors which will make the test more reliable.

*How can Phallometric testing be used to detect pedophilia?*

Written and word association tests are not the only way that pedophilia can be detected and studied. Phallometric testing involves exposing subjects to visual and or auditory stimuli while measuring the changes in their amount of penile blood (Cantor, 2008). A penile plethysmograph is used to record the circumference change of the penis in response to how sexually aroused the stimuli makes the subject (Phallometric Testing). The visual stimulus consists of adult women or children in neutral or provocative positions, while the auditory stimulus usually consists of a person narrating various sexual acts on adult women or children. By receiving a high score on the Phallometric tests, a person is much more likely to be a pedophile than someone who scored low. Phallometric testing is an extremely effective predictor of whether a person has pedophilic tendencies; unfortunately in many cases Phallometric

data is unavailable. The data could be inaccessible due to a variety of reasons including time, cost, and responses being insignificant. In many studies, a person who is undergoing Phallometric testing will also be given a brain scan during the procedure in order to see what areas of the brain become active as the penis becomes aroused (Cantor, 2008).

*How can fMRI tests be used to detect pedophilia?*

Brain scans and functional magnetic resonance imaging (fMRIs ) are useful tools for understanding what makes the brain of a pedophile different than the brain of healthy person. fMRI tests are usually conducted while the subject is exposed to a variety of visual or auditory stimuli, similar to a Phallometric test (Poepfl, 2011; Schiffer, Paul, 2008; Walter, 2007). The brain scans are then reviewed in attempt to find similarities in the functioning of a pedophile's brain versus a healthy person. Using fMRIs to better understand brain morphology in pedophilia is still a relatively new practice; however, the results have been fruitful. fMRIs are providing evidence that pedophiles may in fact have a neurological disorder rather than weak tendencies to make "use of substitutes," as Freud put it. Through countless hours of research, experts are able to recognize common key distinctions in a pedophile's brain such as amount of gray and white matter, the way the frontal cortex reacts to various stimulus situations, and the role of testosterone levels.

*What does eye tracking tell us about pedophiles?*

Pedophilia can be detected by obtaining and analyzing the eye movements of a person when exposed to various visual stimuli. The tests are conducted by showing an image of a child and an image of an adult woman. Researchers measure what parts of the body the test takers are focusing on the most and for how long. Surprisingly, both pedophiles and healthy people spend more overall time looking at the image of the adult than they do at the image of the child. However, pedophiles and healthy people do not look at the same areas on the body for the same amount of time. Pedophiles fixated mostly on the faces and pubic regions of children while healthy people focused primarily on the face and the breasts of the woman. Eye tracking tests have demonstrated that pedophiles find the faces and the pubic regions of children to be the most attractive part of the child. The difference between the focus on pubic regions for pedophiles and breasts for healthy people can be caused by a dysfunction in the brain (Fromberger, 2013). However, more research will be needed in order to determine which area of the brain is producing the difference.

*What is the difference between pedophiles and child molesters?*

Some may argue that researchers should not be spending resources furthering knowledge about new and existing tests because the best way to know if someone is a pedophile is if they have molested a child. However, pedophilia and child

molestation do not necessarily co-occur. The term pedophile holds a completely different meaning than the term child molester; however the two are often wrongfully substituted.

Pedophiles feel a romantic and sexual attraction toward children, but this is not a guarantee that a pedophile will attack a child even if they are alone together in the same room. Pedophiles are solely attracted to children, not adults. Child molesters on the other hand, do not necessarily feel any more attracted to children than they would be to adults. For many child molesters, their actions are fueled by their want to overpower someone, and assert dominance. Children are easy targets for child molesters because they are significantly weaker psychically, and usually have a lack of resources and knowledge of how to get help if abuse is happening. Often, child molesters have poor social skills which cause them to get low levels of sexual satisfaction from adult women, so they then turn to girls that show signs of puberty but that are still below the age of consent (Seto, 2006).

In reality, the owning of child pornography is a greater predictor of pedophilia than any prior physical sexual contact with a child. A person who owns child pornography but who has never molested a child is three times more likely to be pedophile than someone who has molested children and does not own child pornography (Seto, 2006). Researchers conclude that a person who has sexual relations with a child could be due to the person craving sexual contact with no means of subduing their desires with

anyone except for children, however with the vast supply of free and easy to find adult featured pornography, owners of child pornography must go out of their way to find it (Seto, 2006). Freud's original theory of pedophiles looking for "use of such substitutes" to fulfill their sexual urges can be more accurately applied to child molesters who are not pedophiles. It would definitely be incorrect to say that there are no pedophiles that are also child molesters, as sometimes the two terms do overlap. However, it is completely unjust to always put them into the same category without any evidence.

There are multiple means of measure to determine if someone has pedophilic tendencies, but there are other significant differences in pedophiles that further separate them from the general population. The brain morphology of a pedophile is far different that of a healthy person. Notable differences have been observed in the amount of white and grey matter volumes and activations in the prefrontal cortexes. These sizable abnormalities in the brain functioning, suggest that pedophilia is actually a mental illness or disease.

## How does the pedophile brain morphology differ from a healthy brain?

*How does gray and white matter differ in a pedophilic brain?*

Two types of tissue- gray matter and white matter- surround the brain's exterior. The synapses in the brain are located in gray matter because it contains the dendrites, cell bodies, and axon terminals.

White matter is composed of axons that connect various parts of the gray matter which allows for quicker synapses. Recent studies have shown that pedophiles often have less gray and white matter than the average person (Schiffer, Peschel, 2007). In Cantor's 2008 study, 65 participants with diagnosed pedophilia and 62 with no previous history of pedophilia were given Phallometric and fMRI tests. Researchers found that the pedophiles had significantly less white matter than the healthy people. The white matter that the pedophiles did have were only around two main fiber bundles, the superior fronto-occipital fasciculus and the right arcuate fasciculus. Both of these main fiber bundles are responsible for recognizing sexual stimuli. Researchers guess that the lack of white matter relates to developmental problems during childhood as low levels of white matter can also correlate with shorter heights, and lesser memory and IQ. Currently researchers are nonetheless unable to determine if low white matter volume directly causes pedophilia, or if common pedophilic activities like alcoholism cause the low volume. It is also possible that some underlying variable could cause both the pedophilia and the low white matter volume (Cantor, 2008).

*How does the prefrontal cortex differ in a pedophilic brain?*

Recent studies conclude that there are differences in the frontal cortex of pedophile's brain compared to a healthy person (Walter, 2006). There have been differences found throughout the frontal cortex, but arguably some of the strongest

differences have been found in the prefrontal cortex. Researchers have found that pedophiles display a lower amount of activation in their prefrontal cortex compared to healthy people (Walter, 2006). The orbitofrontal cortex is an area of the prefrontal cortex that helps regulate social and emotional behavior especially in regards to reward detection and expectation. In healthy adults, responses to visual sexual stimulation can be detected in the orbitofrontal cortex, however similar responses for visual sexual stimulation cannot be found in pedophiles (Schiffer & Paul, 2008). Some researchers speculate, that dysfunctions in the orbitofrontal cortex can cause other deviant behaviors such as impulsive, or addictive actions. It is entirely possible that the dysfunctions that take place in the orbitofrontal cortex can be caused by the cortex developing incorrectly because of the lack of white matter in the surrounding area (Schiffer & Peschel, 2007). Further research signifies that non-pedophilic child molesters display an even greater dysfunction in the orbitofrontal cortex than pedophilic child molesters. This dysfunction in non-pedophilic child molesters could explain, obsession with dominance and control over others (Schiffer & Vonlaufen, 2011).

#### *How do hormones affect a pedophile's brain morphology?*

The brain is in charge of the creation and upkeep of hormones which control a wide range of communications between the brain and the body. Sexual compulsions are managed by various hormones such as testosterone, serotonin,

and dopamine. Recent research has proven that testosterone levels play a large role in controlling the number and severity of sexual urges. Experts state that disturbed levels of prolactin, dopamine, and serotonin in a person could correlate with pedophilia. Further research is required in order to determine if and how these hormones can induce pedophilia (Jordan, 2011).

There are no clear connections between testosterone and the development of pedophilia, but testosterone levels can be artificially manipulated to control pedophilic tendencies. Experts have reported that offenders of violent sexual crimes or child molestation have much higher testosterone levels than the general population (Jordan, 2011). Currently, a variety of testosterone lowering medications are being used to subdue the compulsions caused by pedophilia. Usually, treatment of testosterone lowering medications is paired with psychotherapy which aims at teaching the pedophile better strategies for controlling their sexual urges. Depending on the specific person and the medications given, 26 - 75.4% of pedophiles show a decrease in the number of sexual urges they feel towards children (Turner, 2013).

Leuprolide acetate is an injectable testosterone depressant that is commonly used among pedophiles. While taking leuprolide acetate, testosterone drops to levels similar to those who have been castrated. Leuprolide acetate causes pedophiles to score lower on phallometric tests that use images of children as stimuli, but the results of the tests are significant

enough to still detect pedophilia. When on leuprolide acetate pedophiles also report less sexual thoughts and less times masturbating to thoughts of children. Once treatment with leuprolide acetate ceases, pedophiles return to their previous amounts of compulsions. Researchers conclude that although leuprolide acetate decreases masturbation and compulsions, the medication did not alter the interest towards children into interest towards adults (Schober, 2005).

### *Limitations and Conclusions*

Research aimed at the most effective measures for identifying pedophiles and discovering differences in the pedophile brain morphology have greatly increased society's understanding about pedophilia. Unfortunately, these studies have had many limitations that prevent an even better assortment of knowledge on the topic. One of the biggest limitations in pedophile based studies are the sample sizes. Often researchers will use the bare minimum of participants needed to validate their study because willing pedophile participants are difficult to find. Many pedophiles are reluctant to engage in pedophilic research for fear of being stigmatized by society, even though the studies promise confidentiality. This fear of stigmatization creates another limitation. Many of the studies rely on the participations of convicted pedophiles and child molesters that have been promised shorter prison sentences in exchange for their cooperation. Since many of the participants are convicted criminals there could be some confounding factor

that skews the results in a direction that does not fit with the general population of pedophiles. Another limitation is that some of the research studies do not match the pedophile groups and the control groups in terms of socioeconomic class or education, which could lead to inconsistencies in the results. Ideally, the studies would be conducted with a large sample size with a matched control group, but for the time being; researchers must make use of what is available.

Despite these limitations, our knowledge about pedophilia is evolving. Pedophilia is not the result of weak people acting out some sexual perversion in order to get attention, but instead the cause of multiple brain abnormalities. Researchers have developed new technologies and methodologies of identifying pedophilia in a person such as IATs, phallometric testing, and fMRIs. While researchers are still not completely sure what causes pedophilia, they have identified differences in the frontal cortex, and in the white and gray matter volumes. Researchers have also uncovered treatments that help subdue pedophilic compulsions with testosterone lowering medications like leuprolide acetate. As research continues, it is in the realm of possibility that within the next few decades, experts will have developed a solid understanding of pedophilia and possibly even a cure. Currently many people hold on to the belief that pedophiles can change if they wanted to. However, pedophilia is not a choice, but instead caused by a variety of brain dysfunctions such as low white and grey matter volumes, and low levels of



activation in the prefrontal cortex. Because of these identified brain differences, pedophilia should be classified as a disease so pedophiles can be professionally treated, as other disease would be. As pedophilic research becomes better known, more people will become comfortable with the idea of helping pedophiles with treatment instead of punishing them for a brain dysfunction.

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