**A study of the growth of the frontal lobe that is not fully developed and behavior during teenagers.**

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**Introduction**

Today's society, the development of skills or the growth of children at each age often has a family is an important variable in encourage of skill and the family is also a role model in shaping their quality of life. So, teenagers are the age that the family should pay a lot of attention to. Due to teenagers are the age when their frontal lobe that part of the brain is not yet fully grown, and the neurologist named Nauta WJH describes the frontal lobe of the brain as "It is the most mysterious part of the cerebral cortex which the development of human frontal lobe of the brain differentiates human behavior and thinking from other animals. Thus, an American neurologist named Tilrey called the era of human development as the era of the frontal lobe" (larbboonsarp, 1994) because the frontal lobe part of the brain has an important role in controlling the mysterious behavior of humans which is control about attitude, learning, living in society and emotions but the control of each person's behavior and thinking will be different. Due to all humans have different frontal lobe brain development which human expressions whether awareness, problem-solving, or emotion regulation, it is considered to reflect the development and growth of the frontal lobe of each individual that has developed fully or not.

During teenagers, the frontal lobe is not fully developed but it will begin to develop fully at the age of about 25 years. Therefore, during adolescence that lifestyle or behavioral expression in various forms is considered a period where there is a risk of showing inappropriate behavior and the risk of making a mistake. (The Institute for Human Centered Design, 2015). Which inappropriate behavior is not only caused by this factor but there are other environmental factors that influence the lives of teenagers as well. Therefore, the frontal lobe of teenagers will be fully developed and have a better quality of life when they have received care, empathize, love and received about the cultivation of a good thing including received admonished for what is wrong by their parents.

On the other hand, there are limitations which are social and economic problems that affect some children's families that cause teens may not receive the utmost care and abandonment because they are far from their parents so, there is no one to give advice and advice on what is right. Which the problems that occur in Thai society that teenagers have inappropriate behavior, aggressiveness and lack of reflection are caused by many factors whether family background, education, finances, attitudes, beliefs. So, all these things affect the behavior of children of this age. The statistical data about Child and Youth Survey from 2008 National Statistical Office (NSO) based on a family basis. It was found that the living characteristics of children between 0-17 years are different as follows: "1.) Children lived with both parents, 61.8% 2.) Children live with their mother only 15.0% 3.) Children living with their father only 3.1% 4.) Children who do not live with both parents 20.1%" (National Statistical Office , 2015). Most single-parent families tend to have financial problems. Therefore, it may affect children of this age. For example, teenagers must go out and find work to support themselves and their families. As a result, brain skills are developed more slowly than other children and according to the National Economic and Social Development Plan (2012-2016), it was found that "Since 2002, Thailand has required all children to receive 9 years of compulsory education up to secondary Grade 3." (National Statistical Office , 2015) which is considered the juncture of teenagers that may cause them to lack thorough thinking and maybe affected by various environments around or being easily persuaded by friends to do bad things or they want to group with friends in order to be accepted.

In Thai society, it can be seen that some teenagers have frequent arguments and inappropriate behavior and from the Department of Juvenile Observation and Protection said “Children prosecuted by juvenile reformatory institutions across the country, most of them are children between the ages of 15-17 years, approximately 30,000 cases per year and the living characteristics of children and youths who were prosecuted found that children whose families were separated that had more offenses than children living with their families and more than 90 percent are men who always commit crimes.” (National Statistical Office , 2015). These statistics show that the problems that arise during teenagers are not the result of mere maturation of the frontal lobes but social factors, family also a part in the behavioral expression, impulse control and analytical thinking on various subjects as well. These factors can cause such violent events that followed if they are not cared for properly.

Therefore, the researchers wanted to study the impact of the growth of the frontal lobe that is not fully developed in parallel with the behavior studies during teenagers, to lead to an understanding of behavior that occurs and to be able to analyze various events in society such as crimes and situations about getting physical during teenagers. So, ​this study will help to analyze the factors that cause problems and how those problems are infringing on rights Including how to find a solution or prevent these problems.

**Statement of the problems**

Problems that are often encountered in Thai society are problems with teenagers such as quarrels, mayhem which some teenagers have aggressive behavior like destroying things and threatening other children in school or even grouping together to cause damage outside the school such as quarrel with children another school including the larger problem is further crimes in various cases, these problems are often caused by a combination of factors. This is partly due to the limitation of the frontal lobe growth of the brain during teenagers is still not fully developed. Due to the frontal lobe is "a significant part of the brain, in terms of social interactions, that affects how we regulate emotions, control impulsive behavior, assess risk and make long-term plans. Also important are the brain's reward systems, which are especially excitable during adolescence. But these parts of the brain do not stop growing at age 18. In fact, research shows that it can take more than 25 years for them to reach maturity." (Johnson, 2019). So, the insufficient development of the frontal lobe results in inappropriate behavior among adolescents, lack of critical thinking and restraint. And to enable the frontal brain to be fully developed must have practiced from childhood which family and social factors are considered that influenced the development of the frontal lobe and behavior that affect the expression of a teenager. Therefore, appropriate or inappropriate behavioral expressions are not caused by brain outcomes alone but there are social factors involved as well.

The problems that arose about inappropriate behavior of teenagers in Thailand reflects the care of the family. There will be some children who are not cared for by their families or parents properly, they were abandoned and ignored. These things that happen to children are a violation of the child's human rights. According to the Convention on the Rights of the Child, it has been stipulated that “Since the first moment children are born, they have the right to life. They have the right to a registered name and nationality. They have the right to be cared for and protected by their parents and not be separated from their families. The government needs to safeguard these rights and provide basic services for children to survive and thrive. This includes quality healthcare, age-appropriate nutrition, clean drinking water and a safe place to live as well as access to future opportunities for development” (Unicef for every child Thailand, n.d.) which this Convention called the Right to Survival. including the Right to Development of Child that Convention has been stipulated that "It focuses on raising children by their parents or in some cases by the state in which the child has the right to have a standard of living sufficient for development and development for the child whether physical, mental, intellectual, moral and social. It also emphasizes that children have the right to an education so that they can develop their personality including children's special abilities and physical and mental abilities to the full potential of each child." (Amnesty International Thailand, 2013). Therefore, if the child is not properly raised and developed that it is considered a violation of both physical and mental rights because the children were neglected and not given enough attention. In addition to family influences that often affect the behavior of children but in fact, adults around children and teachers at school and society in which the child lives are also involved in the behavior of the child. The children who are at risk are children who have a social environment whether in families, schools, communities at risk of maltreatment or abandonment in various forms, which may be harmful to physical and mental health. And affect the development of physical, intellectual, emotional, mental, family, and social. As a result, causing behavioral problems and cause children to lack the ability to think critically and using reason enough.

In another view of Thai society, in event that the child is not under the care of family and is left alone. As a result, the state must come to help and care but some state policies are still inadequately managed and supervised, cause children to lack efficiency and analytical thinking skills in life, resulting in inappropriate behaviors that can become a major social problem.

**Research Questions**

1. Effect from the growth of the frontal lobe brain that is not fully developed. As a result, what impact to teenagers? What are the forms of violence caused by teenagers due to the immaturities of the frontal lobe brain?

2. When studying the effects of maturation of the frontal lobe that is not fully developed until it becomes inappropriate behavior. As a result, what problems do teenagers create and cause human rights violations? What are the prevention measures of violence committed by teenagers?

**Research Objective**

1. To study the growth of the frontal lobe that is not fully developed and behavior during teenagers.

2. To study the reasons why adolescents exhibit inappropriate behavior and human rights violations including being able to analyze the causes of problems in order to find a way to prevent teenagers from causing more behavioral problems in society.

**Conceptual Framework**

A study of the growth of the frontal lobe that is not fully developed and behavior during teenagers. The researcher's conceptual framework to be used in teenager’s behavior analysis is Kurt Lewin's Field Theory Framework. Due to each individual behavior has a different starting point for expression and individualized behavior as "a mixture of responses to external and internal stimuli. It is the way a person reacts in different situations and the way someone expresses different emotions like anger, happiness, love, etc." (Hebergementwebs, 2020) And "Field theory views the behavior of any system as being a function of the interaction of the system and a field of environmental forces as well." (Surachai, 2016) This is like a person's behavior which has connected force and direction together which things are in their interests and needs that will have positive energy and anything beyond attention will have negative energy. Including that direction or force will be in the Life Space of each person. which will consist of multiple dimensions that are the physical environment and the psychological environment. And the different forces will influence each other. So, "These systems are characterized at many levels by genes, molecules, cells, circuits, physiology at the physical level, and description of behavior which all physical levels are considered to influence behavior coupled with neural system level." (Włodzisław, n.d). The field theory framework is expressed using the formula as follow:

“Behavior = Function of person and environment = Function of Life Space.” (Surachai, 2016)

B=F (P, E) = L Sp

So, P = F (L Sp)

\*B= Behavior, F= Behavior Function, P= Person, E= Environment around the person, L Sp= Life Space

Thus, the concept of Lewin believed that behavior is the result of two types of forces which forces have roles that opposite is the resistance force and reinforcement force that will cause change. Applying field theory to analyzing teenager’s behavior is to help understand those behaviors better. It is in accordance with the research conceptual framework as shown in Figure 1.

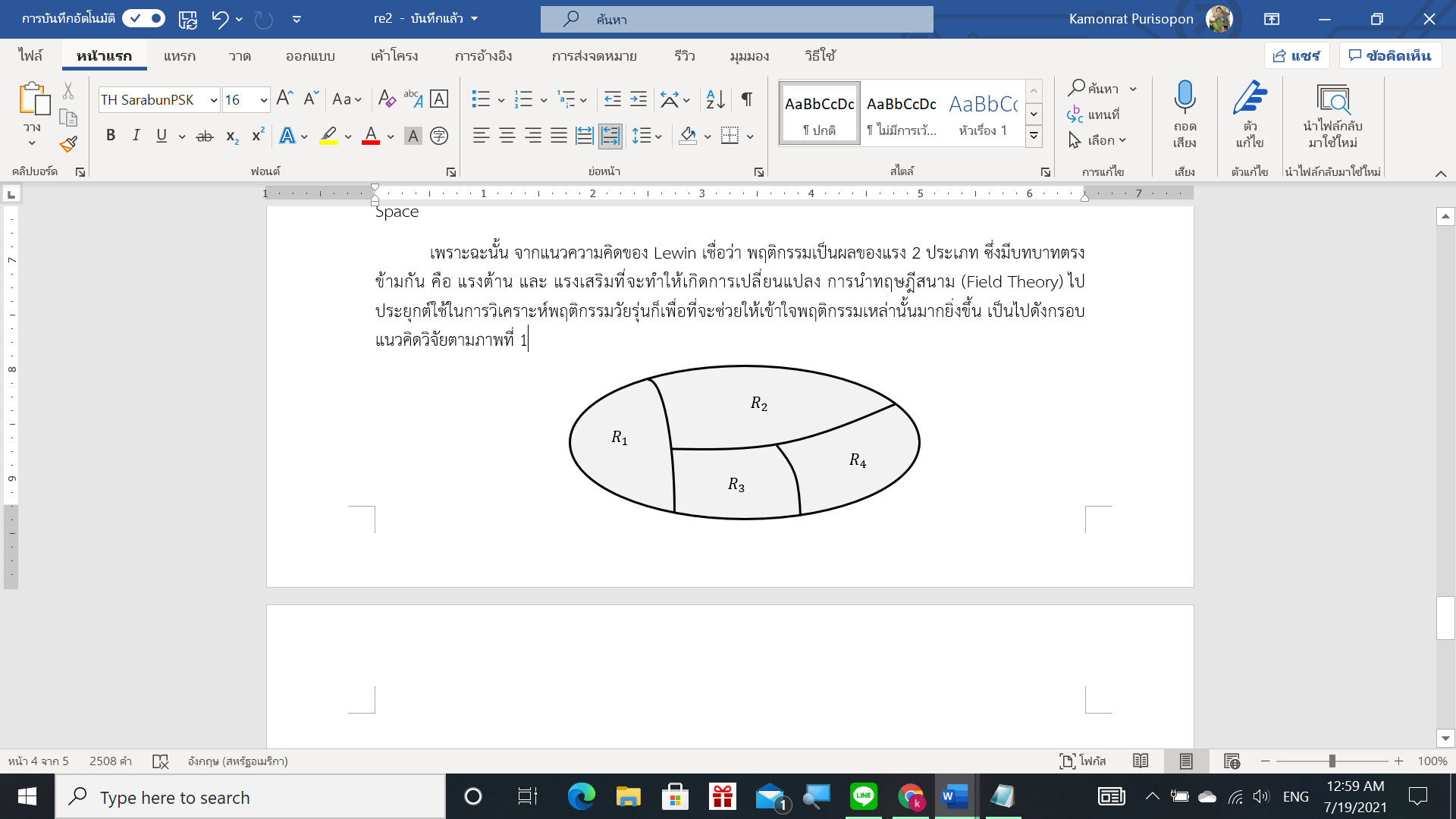


Figure 1. Illustration of Lewin’s force field. (Surachai, 2016)

\*= Individual behavior is now entering adolescence which it consists of many dimensions that affect adolescent behavior such as family background, care, thoughts, financial status, attitudes, levels of prefrontal brain abilities, brain skills.

= Behavior during adolescence where the frontal lobe is not fully developed. This will consist of other environmental factors during adolescence such as family background, parenting methods, schools, teachers, other adults, friends, social media, society and their minds.

= Behavior of other ages.

**Literature Review**

Research on a study of the growth of the frontal lobe that is not fully developed and behavior during teenagers. 1. To study the growth of the frontal lobe that is not fully developed and behavior during teenagers. 2. To study the reasons why adolescents exhibit inappropriate behavior and human rights violations including being able to analyze the causes of problems in order to find a way to prevent teenagers from causing more behavioral problems in society. Therefore, the researcher must study and research the concepts, theories from documents and papers related to research to be used as a guide in the study, gather information and draw conclusions from the research which are as follows:

**The frontal lobe brain during adolescence.**

The brain is one of the most important organs and has a great influence on the regulation of bodily mechanisms and daily life. “The brain weighs approximately 1.4 kg or 3% of the body weight and the brain is made up of 77% water including the brain is up to 1 litre of blood flows to the brain per minute.” (Juthamas, 2015). Each part of the brain, it would have function differently which the part of the brain that the researcher will study is the Frontal Lobe, the part of the brain Cerebrum. The frontal lobe is an important part of movement control and serves to manage the brain that will consist of momentary memory, discreetness and flexibility of thought which is considered a high-level ability because the frontal lobe functions as a primary control, such as planning, analytical control, decision making, problem-solving and determining personality traits.

The frontal lobe brain is very important due to it controls both behavior and emotions but in adolescence, the frontal lobes are not fully developed and each gender has different brain growth. The researcher studied further academic input on the frontal lobe during adolescence which Jay N. Giedd from the Department of Psychiatry said "The growth between female and male adolescent brains is different. On average, girls enter puberty around the ages of 10-14 and boys between the ages of 12-16 which is a result of female physiology that grows faster than males for an average of 2 years." (Giedd, 2015). This means girls will grow taller and look mature faster than boys including the brain growth of females faster than males as well. For young men and women, although the brain grows to its largest size ever but the brains of teenagers are still not fully developed which Jay Giedd's study is consistent with a study on the teenage brain by an American neuroscientist named Frances Jensen has written a new book is The Teenage Brain: A Neuroscientist's Survival Guide to Raising Adolescents and Young Adults. Jensen said "the frontal lobes are responsible for thinking, self-control and a sense of compassion for others but the brains of adolescents cannot perform this function fully. Even though adolescents have a brain that is highly effective at learning, but they are still not able to control themselves fully." (Faiza, 2015). This study also may explain why teenagers often seem so maddeningly self-centered. When they express inappropriate behavior whether surly, rude, and selfish people, Jensen says "Actually, that is the developmental stage they are at. They are not yet at that place where they are thinking about the effects of their behavior on other people. That requires insight." (50 years of NPR, 2010) and she also said "Nature made the brains of children and adolescents excitable. Their brain chemistry is tuned to be responsive to everything in their environment. After all, that's what makes kids learn so easily." (50 years of NPR, 2010). Therefore, this thing may make children this age more vulnerable to drug addiction because they want to learn and it is something that can be learned easily until it may cause as a bad result. Due to addictive substances and alcohol tend to have a more detrimental effect on adolescent brains than adults.

In the academic field mentioned earlier, the researcher concluded the opinion that the brain is extremely important in control behavior, thoughts, and decisions on matters. And the human brain during adolescence is not fully developed and immature until near the age of 25 years which the frontal lobe offers an individual the capacity to apply good judgement when confronting difficult life situations. During the teenager, when the development of the frontal lobes brain is not fully functional, it can cause a lack of restraint, reflective thinking until there is an inappropriate violent behavior including not being able to control their emotions as well as they should. Therefore, it can be explained that why some adolescents expressed behavioral immaturity and a lack of reflection in their thinking including it also shows strong emotions because they cannot control themselves. In fact, there are also other factors involved and the brain is only a part of controlling behavior.

**Examples of abnormal symptoms caused by the frontal lobe of the brain.**

The frontal brain is not fully developed, often directly affects the expression of behavior, emotions, thoughts which behavioral expressions or emotional transmissions that may cause violence and there are abnormalities that are different from the original that often have triggers, is a substance in the brain, there are 3 types of substances as follows:

1.) Dopamine is "a chemical released in the brain that makes you feel good and is an important chemical messenger involved in reward, motivation, memory, attention and even regulating body movements." (Erica, 2018).

2.) Norepinephrine, "plays a role in the sleep-wake cycle, helping you to wake up, in increasing attention and focusing on performing a task, and in memory storage. It is also important for emotions. Problems with norepinephrine levels are associated with depression, anxiety, post-traumatic stress disorder and substance abuse." (Dimaraki, 2019).

3.) Serotonin is "the key hormone that stabilizes our mood, feelings of well-being, and happiness. Serotonin also helps with sleeping, eating, and digestion. However, if the brain has too little serotonin, it may lead to depression. If the brain has too much serotonin, it can lead to excessive nerve cell activity." (Irina Bancos, 2018).

The resulting effects may include abnormalities in the frontal lobes due to the development and training of skills that are not as good as they should be and releases of substances in the brain that is too much or too little are involved in behavioral expression including lack of care from the family as well, which there are many forms of behavioral symptoms such as

Orbitofrontal Syndrome, Vachira said "Behavioral manifestations of this Syndrome is characterized that a lack of thinking control and impulsiveness. This thing will make a person with this condition appear ill-mannered and look like a man who lacks tact and interpersonal skill and may also cause irritability, a bad decision including a lack of prudence that may affect daily life." (larbboonsarp, 1994)

Dorsolateral Syndrome, Vachira said "It is a symptom related to emotion which the person with this condition will look indifferent and there is little response to the environment, lack of self-exploration including loss of language fluency. These traits make the person seem depressed." (larbboonsarp, 1994)

Psychiatric Disorders, Sandra Baez said "patients with schizophrenia show a range of cognitive deficits, particularly in terms of memory and EF. Impairments in working memory, cognitive flexibility, verbal fluency, planning and solving skills." (Sandra, 2020) including also have problems in controlling their behavior, emotions, and managing their thoughts. In which defects in each aspect often affect behavioral expressions "such as shout, running, chaotic, or acting strangely, including thinking and have hallucinations." (Jarurin, n.d).

Mood Disorder is characterized by processing defects and fluency and memory which "people with this disease have two main symptoms: 1. Major depressive episode, there will be a sad mood, boredom, discouragement, loss of appetite, insomnia, thoughts of committed suicide. 2. Manic episode, there will be a lively, cheerful mood or irritability if someone offended them which relapsed each time, there may be bipolar depression and may also have psychotic symptoms." (Jarurin, n.d).

Attention Deficit Hyperactivity Disorder (ADHD), Pikultong and Jintana said "It is a syndrome caused by malfunctions of the brain and nervous system causing mischievous symptoms and impulsive, it is considered a psychiatric disorder that is often found in school-age children which ADHD children have impaired self-control. When they are resentful or angry, they will exhibit aggressive behaviors physically, verbally, and break something that causing problems in daily life and living with others." (Pikultong, 2019).

The researchers thought that these symptoms have behavioral expression that is different or more violent, there are many factors involved whether it is a substance in the brain and abnormalities that occur in the nervous system and brain including family and other external factors. The people who have these disorders often have an impact on daily life and can lead to family problems, people around them and society because they cannot control themselves and some people have symptoms that are severe to be treatment at the hospital for a long period of time and as a result, their minds are fragile and difficult to restore.

**Factors affecting aggressive behaviors in adolescents.**

Adolescence is an age that has changed many aspects, both physical, mind and attitude. And WHO defines adolescents as "individuals in the 10-19-year age group and “youth” as the 15-24 year age group. These two overlapping age groups are combined in the group “young people”, covering the age range 10-24 years." (World Health Organization, 2006) and WHO also clearly recognizes that adolescence is "a phase rather in an individual’s life and is a phase of development on many fronts whether from the appearance of secondary sex characteristics (puberty) to sexual and reproductive maturity, the development of mental processes and adult identity and the transition from total socio-economic and emotional dependence to relative independence." (World Health Organization, 2006) and children of this age have clearly outstanding emotional development. “They tend to show strong feelings, overexpose and direct and sometimes they show off without contemplation including the expression of likes or dislikes of children of this age are often very violent and they are not very hardcore even commenting on adults, it may be said in an inappropriate manner.” (Pathitta, 2017). Therefore, adolescence is the age that there are many trials and errors, and it is also the age that the family should pay special attention. If they are not taken care of properly, it may affect learning and result in study problems such as being unable to study in time, inability to adjust to peers until they have to drop out of school and may be easily influenced in the wrong way. So, the growth of children at this age is a period of change in all aspects that may result in violent behavior.

Aggressive behavior in adolescents is caused by many factors, one of which is "the frontal lobe which is the part of the brain responsible for the advanced functions of cognitive processes and aggressive.” (King, 2011). If the function of this part of the brain is abnormal or still not fully developed, it is a cause for a lack of restraint and analytical error, behavioral and emotional control.

For the factors that cause aggressive behavior, psychiatrists and psychologists have studied a variety of theories. For example, "Freud's Psychoanalysis Theory emphasizes that aggression is caused by instinct which aggressive behavior is instinctive that have action to the outside such as bullying." (Berkowitz, 1968), Berkowitz's Theory of Aggression said that “aggression is an unusually violent act, such as slamming the door vigorously. This action is the behavior that caused the damage and has a desire to harm or destroy something.” (Berkowitz, 1968) which is consistent with Dollard and Miller's theory of aggression, identify that "aggression is caused by the environment and circumstances that provoke it." (John Dollard, 1939). The researcher further investigated the factors that cause aggressive behavior and what is actually happening in society which have an influence of environmental factors affecting the behavior of adolescents is involved, has many factors as follows

**Family Factors**

The child rearing practices from parents in the family when the family is raising children with care. As a result, a teen receives appropriate advice and can openly discuss any problems with his parents because they have the idea that their parents are ready to listen to their problems and offer good advice. But in another aspect, Sirorat found that "the neglect parenting form is related with aggression." (Sirorat, 2008). When they have a neglectful upbringing, not paying attention or not responding to your child's needs. As a result, children in adolescence may lack proper analytical, thinking and no one to suggest what is wrong and what is right, which can result in various problems. Which is consistent with Sirittra Saiboontang, the study found that "the causal factor influencing aggressive behavior was parenting, anxiety, belief in internal and external powers, the relationship between students and friends, relationship between student and teacher, and family relationship." (Sirittra, 2013) including physical environmental factors such as weather also play a role in inappropriate behavior. The study found that "temperature levels were positively correlated with rates of homicide, rape and assault because the higher the temperature, the higher the statistics of such offenses in that area." (King, 2011).

**Social Media and Gender Factors**

Social media plays a part too due to aggression and violence occur in both animated cartoon shows or movies with real people. Despite the fact that "even young children tend to be able to distinguish cartoon programs from the real world. Cartoons containing violence can still impact children’s attitudes towards aggression. Children exposed to cartoons with violent content can develop beliefs that aggression or violence is permissible." (Bjorkqvist, 1985). Similarly, several studies have also found that "even brief exposure to cartoons with violent content can increase a child’s likelihood of exhibiting aggressive behaviors." (Digital Commons @ New Haven, 2015). Therefore, the children who viewed violent videos were more likely to become aggressive when resolving their frustration. So, when they are growing up in adolescence that children may learn from various media accumulated over time, resulting in aggressive and violent behavior. Due to adolescents are in a period that their lack of reflection may lead to violent actions and too late to correct them. The study found that "the factors that influence the relationship between using aggressive media and aggression in children e.g. the basics of child aggression, children's attitudes towards violent and aggression and adult supervision including access to the media of the child." (Feldman, 2013).

Gender plays a role in aggressive behavior as well. "While television is watched at similar rates for male and female adolescents, males tend to use video games more than females, and females tend to use audio and print media more than males." (Friedlander, 2013) and “adolescent males tend to view violent media more frequently than adolescent females” (Friedlander, 2013). Therefore, it can be assumed that adolescents learn aggression by seeing others show aggression and seeing the consequences of aggression until the imitation. This thing is consistent with Bandura's theory of aggression on social learning which identifies that “Aggression arises from the social learning process both from learning occurs through direct experience and observing the behavior of others which children who grow up in families or communities that there is conflict and violence will enable children to learn, this will affect emotional, behavioral and intellectual development." (Bandura, 1986).

**Peers Factors**

When they are older, "they are less influenced by caregivers and more influenced by peers or social groups." (Tarantino, 2014). During adolescence, peers will be considered to play an important role in life. By developing a sense of intimacy with their friends, children do not feel the need to depend on their parents, siblings or close relatives and "with the increased amount of time spent with peers during adolescence, there is an increased likelihood that adolescents will spend more time alone with their peers or at the homes of their peers." (Digital Commons @ New Haven, 2015). However, not all children and adolescents develop close peer relationships which Eron found that "aggressive children were less popular among their peers than non-aggressive children." (Eron, 1982).

Therefore, these children may spend more time watching television media and tends to be violent television programs. As a result, imitative behavior becomes an expression of aggression and violence due to their social interactions are unsatisfactory including they tend to have an inappropriate attitude, the view that violence is normal and can be done without seeing it as inappropriate. They think that those actions express courage, dignity and powers that are superior to others and also see that when doing it will get good results back such as acceptance, get what they want or have been honored by friends. In addition, there are also contributing factors that "are personality traits of teenagers who are easily angry, mood changes easily, emotions poor self-control, like independence, choose friends who have a history of quarrels or like to be anti-social. So, these will encourage more violent behavior." (Child and Adolescent Mental Health Rajanagarindra Institute, 2013).

**Forms of Aggressive Behavior in Adolescent**