Anxious Attachment and Social Information Processing: A Proposal Testing the Relationship between Anxious Attachment and Offensive Schema among Adolescents

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ABSTRACT

Anxious Attachment and Social Information Processing: A Proposal Testing the Relationship between Anxious Attachment and Offensive Schema among Adolescents

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This thesis proposes a study to test the hypothesis that adolescents with anxious attachment tend to be more likely to have an offensive schema in their social information processing. The measure of the offensive schema will be achieved by the correct response and response times in a recognition task. Participants will undergo a series of tests. The Experience in Close Relationship (ECR) will be used to test their attachment type. Puppet learning task and recognition task will test their correct responses and response times. As a preliminary study, the results from this proposed study will help shed lights on future research on the potential meditational role of schema in linking the relationship between anxious attachment and aggressive behaviors in adolescents.
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Anxious Attachment and Social Information Processing: A Proposal Testing the Relationship between Anxious Attachment and Offensive Schema among Adolescents

Aggressive behavior is the behavior that injures or irritates others (Eron, Walder, & Lefkowitz, 1971; Berkowitz, 1993). Previous studies have supported a general impression that children become more physically aggressive when they grow up. From a longitudinal study, Loeber, and Stouthamer-Loeber (1998) indicated that before five years, less than 5% of children show minor aggression; however, this improper behavior is suddenly intensified when they reach to 13 years of age. Close to 40% of children admitted their aggressive behaviors (Loeber, 1998). In another longitudinal study, Elliott also provided a similar result. Accumulated data showed that adolescent deviant behaviors increase rapidly from 12 to 17, but are followed by an equivalently decrease (Tremblay, 2000). The whole behavior patterns have been labeled the age-crime curve (Elliott, 1994).

Beyond question, adolescent aggressive behaviors appeal to psychologists to study since the last century. Millions of studies have tried to explain its potential causalities. Some of them suggested that the environment with aggressive triggers will facilitate an individual with the innate aggressive characteristic to behavior more aggressively (Wicks-Nelson & Israel, 2000). Some suggested that violent video games can predict the aggressive behaviors in adolescents (Gentile, Lynch, & Walsh, 2004). Some also suggested that the less parental supports, the more likely the adolescents are to be involved in aggressive behaviors (Herrenkohl, Maguin, Hill, Hawkins, Abbott, & Catalano, 2000). However, few of them
detected the problem from the perspective of mental representations (internal working model) of attachment relationships. Recently, Allen, Porter, McFarland, McElhaney, and Marsh (2007) indicated that insecure attachment can predict relative increase in externalizing behaviors at age 16. Their study shed a light on the relationship between insecure attachment and adolescents’ aggressive behaviors.

**The core concept of internal working model in attachment theory**

According to attachment theory (Bowlby, 1970; Bowlby, 1982), infants acquire attachments from their available adult caregivers. On one hand, they see the caregivers as safe havens and seek for proximity in times of need for protection and survival. On the other hand, they regard the caregivers as secure bases from which they can confidently explore the new world around them (Goldberg, 1999). After repeated daily living with the caregivers, infants will gradually store their experiences to form a mental representation, called the internal working model (IWM). It starts in the second half of the first year. Successful building of a mental representation is crucial for infant’s current and future development. It assists them to obtain not only an account to save the information of relationship with their caregivers, but a way to interpret information in closed relationships later on. For instance, an infant with a secure attachment usually enjoy a reliable, consistent supports, protection, and comfort from his caregiver who is sensitive to his needs. His fully equipped IWM will be formed and assist him in the future to gather and interpret the information related to other social agents (such as peers teachers, and romantic partner) properly and confidently.

In the late 1970s, twenty minutes observation of laboratory experiment
Strange Situation (Ainsworth.Md & Bell, 1970) made it possible to test infant’s ability to use their caregiver as a secure base (Waters & Waters, 2006). The key of the Strange Situation is the reunion, followed by several minutes’ separation between infants and their attachment figures. During the reunion, infant behavior will most reflect its mental representation (Main, 1985). The securely attached infants, for example, take their parents as a secure base. After being engaged in stress (parents’ separation), they are able to seek proximity, interact with their parents, obtain comfort and finally return to the world exploration. On the contrary, for the insecure attached infants, they fail to seek the proximity from their parents, indicating that their mental representation to parents’ protection is weak. In other words, they do not trust their parents as their safe haven, in return for the parents’ absence supports when they are in need.

**Attachment and Autonomy in Adolescents**

After Bowlby (1970), hundreds of studies paid big attentions on the topic of attachment in infants and childhood, some in adult, but only very few focused on attachment security in adolescence. Unlike infancy and childhood, adolescent’s secure attachment is characterized as internal state of mind rather than a physical relationship with caregiver (Allen, et al. 2007). The model of adolescent attachment is regarded as an organizational construct to capture multiple facets of behavior and cognition. The facets are potentially connected to their various ongoing relationships, such as peers and the romantic partners (Sroufe & Waters, 1977).

More specifically, security in adolescent attachment is conceptualized as the capacities to maintain a sense of relatedness, when they are striving for autonomy with important others. Also, it is the capacities to regulate their emotions, when
they process the negotiations of autonomy-relatedness (Allen, McElhaney, Land, Kupermine, Moore, O’Beirne-Kelly & Kilmer, 2003). It is worth noting that “secure”, used to describe the internal representation of attachment, is replaced by “autonomous” in valuing of adolescent’s attachment (Main, 2002). The terminology change is not the result that Main (2002) gave up finding a pure adult analog corresponding to infant security, but the limitation of measurement which is unqualified to test the complete scope of adolescent’s security.

Adult Attachment Interview (AAI) has been most frequently used to test adolescents’ state of mind (George, Kaplan, & Main, 1996). However, attachment autonomy, as assessed, is not necessarily as direct analogous as the construct of attachment security in previous infant tests. Some explanation indicated that AAI was in fact measuring some kinds of emotion regulation, “related to memories of intense childhood experience” (Allen & Miga, 2010). In spite of this, AAI is still recommended as a principle measure in attachment research (Dykas & Cassidy 2011). Firstly, there is a properly high correspondence between AAI autonomy and infant security in the Strange Situation (Fonagy, 1991). Also, the AAI classification is in line with infants’ Strange Situation classification. Specifically, secure-autonomous, insecure-dismissing, and insecure-preoccupied in AAI are representatively corresponding to secure, insecure-avoidant, and insecure-resistant in infancy. Meta-analysis data indicated a 75% concordance between these two classifications (Biringen, 2005).

**Autonomy struggles in adolescent-family interaction and their aggressive behaviors**

Many studies have devoted to the social interaction of adolescents and tried to find out the causalities to their increasing aggressive behaviors. Unfortunately,
this behavioral dysfunction has been less targeted from the perspective of social relationships, especially the parent-child relationship in adolescents.

Attachment theory does offer a way to explore the problematic behaviors from a dyadic relationship in family. Logical thoughts from the attachment theory can support an idea that the insecure attachment experience will fail to provide adolescents a secure base, which neither encourages them to explore their talents and pursue their achievements in various contexts, nor prepares them to become socially and confidently connected with others. Fortunately Allen and his colleagues’ studies support this thought to a certain extent (Allen, Hauser, O’Connor, & Bell, 2002). They found that the difficulties in balancing the autonomous negotiations and relatedness with parents during adolescence will predict their later aggressive behaviors in peers. More specifically, they believed that on the account of failure to establish autonomy-relatedness with parents in families (insecure attachment), adolescents will prefer simple hostile behaviors rather than complex negotiations to deal with the relationship with their parents. Once the pattern of problematic behavior is set up, adolescents will automatically replicate it in a new relationship as they grow older. They also believed that experiencing the parents’ suppressions upon the autonomy striving, adolescents will rise in revolt by using hostile behaviors instead of establishing autonomy-relatedness patiently. Over and over again, this pattern to deal with the autonomous threat will be internalized and similarly generalized into their future new relationships. As expected, their study results suggested that insecure attachment demonstrates a trend toward association with higher levels of externalizing behavior at age 13 (Allen, et al. 2007).

Admittedly Allen’s studies were in the leadership on the relationship between
adolescents’ insecure attachment and their potential aggressive behaviors in the context of family. However, the autonomy-relatedness in their studies should not be taken as completely equal as the interpretation of adolescent attachment. In my view, Autonomous negotiation is a behavioral outcome of the internal working model, rather than its representation. When we try to follow the trajectory of the insecure attachment, we need to have a close eye on the underlying cognitive models, which are the truly motive power to guide feelings, behaviors and social interactions. Therefore, it is significant to research on how the dysfunctional mental representation (internal working model) leads to the aggressive behaviors under the relationship of insecure attachment between parents and adolescents.

**Social Information Processing**

In the second half of last century, social cognitive development in psychology has a big productive movement, marked by the study in social information processing (SIP) and antisocial behaviors in childhood and adolescence (Fontaine, 2010). Generally, SIP is a cognitive process, taken as mediating process to connect biological, environmental, and situational inputs and individual’s behaviors outputs.

There are two social information processing models to explain people’s aggressive behaviors successfully. One, developed by Huesmann, is focusing particularly on scripts, beliefs as observational learning (Huesmann, 1988; Huesmann & Guerra, 1997). It focuses mainly on scripts, and their acquisition and retrieval.

Specifically, SIP is supposed to be the result of deep *schemas* in this model. The schema consists of organized representation of past behavior and experiences as a function of theories that guides an individual’s subsequent perception and
appraisal of the world (Segal, 1988). When the separated schema is formed, they link together in a sequence, representing expected event and actions. The sequence schemas are called *script*. It was Abelson (1976) who first use this term. By demonstrating a series of events, the script served as a guide for behaviors with inference of what will likely happen, and how to deal with situation appropriately. In Huesmann’s model, he hypothesized that “people use heuristic research process to retrieve a script relevant to the situation” (Huesmann, 1998). For example, aggressive people more likely presume to encode a large number of aggressive scripts which finally encourage their aggressive behaviors.

The other social information processing model was designed by Dodge (1994). In his theory, SIP is conceptualized as a group of stepwise mental mechanisms, represented in a form of limited capabilities and database in the memories of past experience (Dodge, 1986; Crick & Dodge, 1994). When people come into a social situation, the mechanisms are stimulated by the external series of cues, and actively process the cues in the behavior responses.

Dodge’s model (1994) includes five social-cognitive steps. First, encoding of cues, an individual attends to a particular situation to organize the features of the cues. Second, interpretation of cues, the individual attributes to the cues to make a personal meaning of it. Third, clarification or selection of a goal, the individual identifies and prioritizes his objectives. Fourth, response access or construction, the individual accesses from his possible memory to construct new behaviors in responses to the situation. Fifth and finally, response decision, the individual evaluates the previously accessed responses in order to select the most positive one for behavioral enactment.

Both theories above were drawn from Bandura’s earlier formulation of
cognitive processing (Bandura, 1977; Bufford, 1986) and both emphasized on non-linear developmental pattern. However, many differences are obvious. The most crucial one is whether social cognitive processing is more “on-line” in Dodge’s model, or schema-based in Huesmann’s model.

In my view, it is unnecessary to distinguish them either this or that. On the contrary, the two models should be unified to a certain context. Especially, in the first two steps of Dodge’s model, when an individual attends to encode and interprets the external cues, schema-based explanation is more helpful for understanding.

Specifically, an individual may experience at least three types of sub-cognitive processing in the initial two steps of Dodge’s model. First, the activation of a particular schema or script from memory; environmental stimuli (cues) first triggers the individual to retrieve schema from his memory and to define the current situation. It includes using the scripts to analyze the causality of the event, attribution of the intent, and inference about the perspectives. Second, filtering, it is a testing process that either determines the accuracy of information, or activates the scripts to continue or not. This process is in fact used to limit the effect of activated information. Not all the active information will be processed in the following steps, except those accurate and useful. Third, it is the evaluation. After a script being activated and before acting out it, the individual will evaluate the script corresponding to his internal schemas, and determine the appropriate outcome of his behaviors. The boundaries of three are obscure, and their sequences are not exactly fixed, either. Sometimes, filtering and evaluation are happened simultaneously and aim at the efficiency of information input.

Therefore, at very beginning of this unified model, it seems extremely
important to retrieve a schema accurately from the memory, because it defines the current situations. Otherwise the whole cognitive system will fail to dispose objective information from the reality, but the information represented by the activated schemas.

**Internal Working Model, Social Information Processing, and Aggressive Behaviors**

Huesmann repeatedly emphasized in his study that social information process does not “cause” behaviors; instead, it plays a role as a mediating process that connects between external situations, internal schemas and aggressive behavior in predictable ways (Huesmann, 1998). The problem is what “causes” the aggressive behavior? Superficially, it is the certain sort of external situations with certain cues trigger the behaviors. Nevertheless, it is less meaningful to pay attentions to this. Instead, we should focus on the dysfunction and trajectory of internal schema. I have reasons to believe that aggressive people have obtained some schemas with a character of aggression. As a result, they are sensitive to the stimuli related to aggressive-schema, and habitually use their schemas to make quick judgments in bias (Kanagawa, 2001).

More specifically for aggressive adolescents, they may have an insecure attachment with their parents. Their cognitive capacity is incapable on balancing their autonomous needs and relatedness with parents. After the repeated failure of autonomy-relatedness, adolescents may gradually develop an aggressive coding strategies characterized with a specific aggressive-related schema. The schema would solidify the strategies in return, resulted from the aggressive-related information activated continually.

Some available data have partially supported my thought. For example,
Dykas and Cassidy found that lower AAI coherence of mind was related to the higher expectations of rejection by others (Dykas, Cassidy, & Woodhouse, 2009). Also, adolescents with insecure attachment make less positive attributions of friendships (Mikulincer & Selinger, 2001; Zimmermann, 2004). These studies suggest that the insecure attached adolescents are inefficient on perception and expectation on social information. Comparing to their secure peers, they are more accustomed to adopt negative schemas.

However, it is still unclear which kind of specific aggressive-related schema is used by the adolescents with insecure attachment. Therefore, in present study, I propose to explore one aggressive-related schema in the population of insecure attached adolescents. I hope this schema will be helpful in explaining the development of adolescent aggressive behaviors.

The Present Study

Previous researches have indicated that people’s attachment orientations can be measured based on two dimensions: attachment-related anxiety and avoidance (Bartholomew & Shaver, 1998). The individual who exhibits avoidance attachment is characterized as refusing to trust other’s goodwill and capacity to help when he is in a time of need. He prefers to maintain a safe degree of independence and self-reliance (Ein-Dor, Mikulincer, & Shaver, 2011). In contrast, anxious attached people fear losing others or being abandoned by them (Dykas & Cassidy, 2011). They are always worried that others will not support them when they are in a time of need.

Individuals with anxious attachment usually are very careful about their relationships with partners in social interactions, and they are dependent on others to a certain extent (Mikulincer & Shaver, 2007). In parents adolescents
interactions for instance, anxious attached adolescents cling to their parents and make a great effort to achieve high levels of intimacy and approval. In order to protect their intimacy to their parents, they act hyper-sensitive to any possible offences, from apparent offensive information to presumed potential cues. As a result, their coping strategies are hyperactive, energetic but unreliable, and their corresponding behaviors are aggressive and hostile. Repeatedly practicing these strategies will contribute to the formation and consolidation of a particular type of cognitive schema in explanation of the offence (Ein-Dor et al., 2011).

According to Rumelhart’s theory (Rumelhart, 1980), a schema consists of a number of default placeholders, which provides improper behaviors to deal with particular situations. Usually, the schema is helpful for the individual to response quickly. However, when the situation fails to provide sufficient or clear information for the individual to cope with, the default placeholder will be quickly adopted. We expect the schema of the adolescents with anxious attachment to have several default placeholders, which lead them (a) to remain vigilant with respect to possible offences, especially in ambiguous and unfamiliar situations; (b) to respond strongly and quickly to even unclear cues of offences; (c) to alert others to stop the imminent offence; (d) to make a great effort to stop the offences if others do not stop it (includes either the apparent or potential offensive information); (e) to have an emotional experience. I call this schema the offensive schema.

In this study, I propose to test whether adolescents with anxious attachment would be more likely to use the offensive schema in social information processing to deal with family situations. I will examine the relationship between anxious attachment and memory for core components of the offensive schema. According
to previous studies, a well-developed and highly-accessible schema can increase and speed up either the recognition of schema-related information from a previous learning task, or the false recognition of schema-related information, which are actually never presented in the previous learning task (Markus, 1977; Lurigio & Carroll, 1985). In the same way, a well-developed offensive schema is sensitive to offensive related information and lead individuals to respond quickly and strongly.

Therefore, I hypothesize that adolescents with higher level of anxious attachment tend to have higher correct response to the old offensive related information (have provided in a previous learning task), comparing to the old neutral information. In addition, these adolescents tend to have lower correct response to the new offensive related information (have never been provided), comparing to the new neutral information.

I also hypothesize that adolescents with anxious attachment tend to response faster to offensive related information, comparing to neutral information.
Method

Participant

One hundred adolescents will be recruited from middle schools and communities in Massachusetts, with an equal number of males and females. All the participants must have completed the elementary school and be able to speak, read and write English. All the participants are studying in the 7th grade and are 12 years old. Informed consent will be obtained from the documented legal guardians of the participants.

Instruments

Experiences in Close Relationship (ECR)

The ECR (Bartholomew & Shaver, 1998; Mikulincer & Shaver, 2007) is a self-reported measure of adolescents’ and adults’ attachment styles: the anxious attachment and avoidant attachment in the context of close relationships on a 7-point scale, ranging from 1 (not at all) to 7 (very much). Participants will rate the degree to which each item describes their feelings in close relationships. There are 18 items to test anxious attachment, for example, “I worry about being abandoned”. Another 18 items are to test avoidant attachment, for example, “I prefer not to show a partner how I feel deep down”. The reliability and validity of the scales have been repeatedly proven to be good, with Cronbach’s alphas equal or greater than .90 (Simpson, 1996; Fraley, Niedenthal, Marks, Brumbaugh, & Vicary, 2006; Ein-Dor et al., 2011).

Puppet Answering Question (PAQ)

Previous studies used a real person to response to questions in the learning
task (Ein-Dor et al., 2011). However, it has some problems. For example, the person’s facial expression and face attractiveness will affect the information input of the participants. Therefore, I will use a puppet instead of a real person in learning task. The puppet with an adolescent’s voice will answer 12 open-ended questions about daily family situations. Six of the questions are neutral, for example “When you have dinner with your parents, they ask you to wash the dishes. What do you think about this? What is your feeling?” The other six questions deal with offensive-related issues. For example, “When your mother denies your favorite hair style, what do you think about this, how are you feeling?”

The puppet’s responses have two types. One is sensitivity to the offensive-related question, for an example “I would be very uncomfortable; this is an insult”. The other is keeping calm, for an example “I am usually calm in this situation, nothing will affect me”.

Recognition Task Sentences (RTS)

Previous studies have supported that using groups of sentences in a recognition task is efficient to test the memory and response time for the participant (Ein-Dor et al., 2011). In this study, after the puppet answering questions video, there will be a recognition task, in which thirty six sentences will be represented. Eighteen sentences will deal with neutral issues. For example, “I will wash the dishes”. The other 18 sentences will deal with offensive-related issues”. For example, “I will be very angry when she is saying like this”. Each group of sentences will be further divided equally into two sub-groups, which include the nine sentences that appeared in the original video clip and the other nine new sentences.
Procedure

Adolescents will complete two separate sections in this study. In the first section, they will complete the Experiences in Close Relationship (ECR) scale. In the second section, they will undergo a series of cognitive tasks. At first, they will watch a video clip performed by a puppet with an adolescent’s voice. The puppet is made to give answers to both offensive-related and neutral questions about family situations. There will be 12 open-ended questions from a voiceover. Six of the questions are neutral, while the other six deal with offensive-related issues. The order of the questions will be semi-randomized so that the same type of question will not be put together.

Participants will be randomly assigned two conditions. In the experimental condition (n=50), the puppet is highly sensitive to the offensive-related information and easily alerted to stop the imminent offense. For example, “I would be very uncomfortable; this is an insult; how can they treat me in this way?” By comparison, in the control condition, the puppet’s responses are neutral to the offensive schema. The puppet will remain calm when the offensive related information is shown. For example, “I usually calm in this situation, nothing will affect me”. Following the video, participants will complete 10-min distracter tasks, such as subtracting 27 backward from 2012.

In a following recognition task, all the participants will be asked to determine as quickly and accurately as possible whether the sentences have been presented in the previous puppet task. There will be 36 sentences on a computer screen. Eighteen of them will deal with neutral issues, and the other eighteen will deal with offensive-related issues. Each group will be further divided equally into two sub-groups containing 9 sentences that appeared in the original video clip and the
other nine are new.

A computer with DirectRT version 2012 software as the experimental platform will administrate the recognition task. Each sentence will begin an X in the center of the screen for 500 ms, and then the sentence shows up. The target sentence will be displayed in yellow lettering on a black background in the center of the screen. Participants will be asked to make a judgment as quickly and accurately as possible. If they think the sentence has been appeared, they need to click F on the keyboard, or they click J to indicate that the sentence has not been appeared. Sentences will remain on the screen until participants press a key. Reaction time will also be recorded.

**Data Analysis Strategy**

There are three hypotheses in this study. Firstly, adolescents with an anxious attachment tend to have higher correct response to the old offensive related information (have provided in a previous learning task), comparing to the old neutral information. Secondly, these adolescents tend to have lower correct response to the new offensive related information (have never been provided), comparing to the new neutral information. Thirdly, these adolescents tend to response faster to offensive related information, comparing to neutral information.

Correspondingly, there are two dependent variables: the accuracy and the time of participants' response to the 36 sentences. For the first dependent variable, I will score the percentage of accurate response (labeled AR) for each participant by the type of the sentences. The sentence type will be determined by whether it new or old, or whether it is offensive or neutral. Specifically, the 36 sentences have four types: old with neutral (ON), the sentence describes neutral issue and has been previously presented in puppet task; old with offensive (OO), the
sentence describes offensive-related issue and has also been previously presented; new with neutral (NN), the sentence describes neutral issue but has never been presented; new with offensive (NO), the sentence describes offensive-related issue but never been presented. As a result, each participant will have four scores in AR, one per sentence type.

For the second dependent variable, I will score the mean of response times (RTs) for each participant by the type of the sentences. The four types of the sentences will be adopted again. Similar to the measure of AR, each participant will have four scores in RTs, one per sentence type.

To test the hypotheses in this study, a recommended approach will be first to model the different effect in four types of sentences within an individual. Then it will examine the different effect of covariates between individuals. Hierarchical Linear Modeling (HLM) will be used (Luke, 2003).

For example, to test the first two research hypotheses about the ARs, a series of HLM models will be tested as following:

The first will be the null models: Level 1: \( \text{AR}_{ij} = \beta_{0j} + r_{ij} \); Level 2: \( \beta_{0j} = \gamma_{00} + \mu_{0j} \).

Where \( \text{AR}_{ij} \) is the accuracy response for the \( i \)th participant (\( i = 1, \ldots, 100 \)) on the \( j \)th sentence type (\( j = \text{ON}, \text{OO}, \text{NO}, \text{NN} \)).

This null model serves as a baseline and will provide information on how much variation in AR is between participants and how much is within participants between different sentence types.

The second will be the conditional model where indicator of sentence types will be incorporated in level one model:

Level 1: \( \text{AR}_{ij} = \beta_{0j} + \beta_{1j} \cdot \text{ON} + \beta_{2j} \cdot \text{OO} + \beta_{3j} \cdot \text{NO} + r_{ij} \).

Level 2: \( \beta_{0j} = \gamma_{00} + \mu_{0j} \) \( \beta_{1j} = \gamma_{10} + \mu_{1j} \).
\[ \beta_{2j} = \gamma_{20} + \mu_{2j} \quad \beta_{3j} = \gamma_{30} + \mu_{3j}. \]

The estimation and hypothesis testing on the \( \gamma_{00}, \gamma_{10}, \gamma_{20}, \) and \( \gamma_{30} \) terms will help test whether different sentence types will have different ARs.

The third set of HLM model will include anxious attachment (continuous scale) and conditions (dummy coding: experiment vs. control), the two level-2 measures in the model:

**Level 1:** \( AR_{ij} = \beta_{0j} + \beta_{1j} \times ON + \beta_{2j} \times OO + \beta_{3j} \times NO + r_{ij}. \)

**Level 2:** \( \beta_{0j} = \gamma_{00} + \gamma_{01} \times Anxious\ Attachment + \gamma_{02} \times condition + \mu_{0j} \)

\( \beta_{1j} = \gamma_{10} + \gamma_{11} \times Anxious\ Attachment + \gamma_{12} \times condition + \mu_{1j} \)

\( \beta_{2j} = \gamma_{20} + \gamma_{21} \times Anxious\ Attachment + \gamma_{22} \times condition + \mu_{2j} \)

\( \beta_{3j} = \gamma_{30} + \gamma_{31} \times Anxious\ Attachment + \gamma_{32} \times condition + \mu_{3j}. \)

The estimation and hypothesis testing on the comparison of \( \gamma_{11} \) and \( \gamma_{21} \) will help to test whether adolescents with higher level of anxious attachment tend to have higher correct response to the old offensive related information, comparing to the old neutral information. Similarly, the estimation and hypothesis testing on the comparison of \( \gamma_{01} \) and \( \gamma_{31} \) will help test whether adolescents with higher level of anxious attachment tend to have lower correct response to the new offensive related information, comparing to the new neutral information.

A similar approach will be adopted to test the third research hypothesis on the reaction times.

**Study Limitation**

In this thesis, I propose a study test that the adolescents with insecure attachment (especially the anxious attachment) would be more likely to have the offensive schema in their social information processing. Although the measure of memory accuracy and response time can be taken as a way to explore the
relationship between adolescents with insecure attachment and the offensive schema, it has some limitations. They are incompetent to quantify the schema. We do not know the percentage of accurate memory and the exact response time that anxious attached adolescent have. For this reason, the schema in this study can’t be a predictor to the outcome-aggressive behaviors. In the future study, the measurement of schema should be improved.

What is more, future studies should pay more attentions to the potential meditational role of the offensive schema in building the relationship between anxious attachment and aggressive behaviors in adolescents.
Reference


(Eds.), *Attachment theory and close relationships* (pp. 46-76). New York: Guildford Press.


Segal, Z. V. (1988). Appraisal of the self-schema construct in cognitive models of


