EARLY MALADAPTIVE SCHEMAS, SCHEMA MODES, AND ALCOHOL USE AMONG COLLEGE STUDENTS: THE MEDIATION ANALYSIS

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EARLY MALADAPTIVE SCHEMAS, SCHEMA MODES, AND ALCOHOL USE AMONG COLLEGE STUDENTS: THE MEDIATION ANALYSIS

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ABSTRACT

The objective of the current study was to develop and examine the structural relationship between early maladaptive schemas (EMSs) and alcohol use among college students, in which schema modes were identified as mediating factors. A total 973 participants of the current study were undergraduate students registered in the academic year 2014-2015 in Chiang Mai. Three research questionnaires were administrated, including Young Schema Questionnaire 3^{ed} –Short Form, Schema Mode Inventory, and Alcohol Use Questionnaire.

The results indicated that the modified hypothesized model of relationship among EMSs, schema modes, and alcohol use among college students fitted with the empirical data (χ^2= 2185.313, df = 491, χ^2_{df} = 4.451, RMSEA = .060 (90% CI: .057 - .062), CFI =.900, and SRMR = .062). The EMSs and schema modes could explain the variance of alcohol use among college students at 12%. Disconnection and Rejection domain and Impaired Limits domain were positively associated with alcohol use; these relationships were fully mediated by the schema modes. The total effects on alcohol use were .132 and .221 respectively. Impaired Autonomy and Performance domain had a negative association with alcohol use, which was partially mediated by the schema modes (total effect = -.295: direct effect = -.252, and indirect effect = -.043). Exaggerated Standards domain was not significant associated with alcohol use.

The findings suggested that the unique schema processes through which different EMSs may operate; therefore, interventions for reducing college drinking may take the concept of EMSs and schema modes into consideration. The theoretical and practical implications are also discussed.

KEY WORDS: EARLY MALADAPTIVE SCHEMAS / SCHEMA MODES / ALCOHOL USE / COLLEGE STUDENTS / SCHEMA-FOCUSED THERAPY

196 pages

แบบแผนความคิดที่เกิดจากการปรับตัวไม่เหมาะสมจากวัยเยาว์ สภาวะของแบบแผนความคิดกับการบริโภคเครื่องดื่มผสมแอลกอฮอล์ในนักศึกษา: การวิเคราะห์ตัวแปรส่งผ่าน

EARLY MALADAPTIVE SCHEMAS, SCHEMA MODES, AND ALCOHOL USE AMONG COLLEGE STUDENTS: THE MEDIATION ANALYSIS

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บทคัดย่อ

การศึกษาครั้งนี้มีวัตถุประสงค์เพื่อพัฒนาและทดสอบแบบจำลองความสัมพันธ์เชิงโครงสร้างของอิทธิพลของแบบแผนความคิดที่เกิดจากการปรับตัวไม่เหมาะสมจากวัยเยาว์ที่มีต่อการบริโภคเครื่องดื่มผสมแอลกอฮอล์ของนักศึกษา โดยมีสภาวะของแบบแผนความคิดเป็นตัวแปรส่งผ่าน กลุ่มตัวอย่างในการศึกษาครั้งนี้เป็นนักศึกษาปริญญาตรีที่ศึกษาอยู่ในจังหวัดเชียงใหม่และได้ลงทะเบียนเรียนในปีการศึกษา 2557 จำนวน 973 คน เครื่องมือวิจัยประกอบด้วยมาตรวัดจำนวน 3 ฉบับ ได้แก่ Young Schema Questionnaire 3^{cd} –ฉบับสั้น, Schema Mode Inventory (SMI) และแบบวัดการบริโภคเครื่องดื่มผสมแอลกอฮอล์

ผลการศึกษาพบว่าแบบจำลองสมมุติฐานที่ปรับแก้แล้วของความสัมพันธ์ระหว่างแบบแผนความคิด สภาวะของแบบแผนความคิดและการบริโภคเครื่องดื่มผสมแอลกอฮอล์มีความสอดคล้องกลมกลืนกับข้อมูลเชิงประจักษ์ดี (χ^2 = 2185.313, df = 491, $\chi^2_{/df}$ = 4.451, RMSEA = .060 (90% CI: .057 - .062), CFI =.900, และ SRMR = .062) แบบแผนความคิดและสภาวะของแบบแผนความคิดร่วมกันทำนายการบริโภคเครื่องดื่มผสมแอลกอฮอล์ได้ร้อยละ 12.0 แบบแผนความคิดกลุ่มไม่สามารถสร้างปฏิสัมพันธ์และถูกปฏิเสธ และกลุ่มการขาดความยับยั้งมีความสัมพันธ์ทางบวกกับการบริโภคเครื่องดื่มผสมแอลกอฮอล์ โดยมีสภาวะของแบบแผนความคิดเป็นตัวแปรส่งผ่านอย่างสมบูรณ์ ค่าอิทธิพลรวมเท่ากับ .132 และ .221 ตามลำดับ กลุ่มของแบบแผนความคิดด้านขาดอิสระและความสามารถในการดูแลตนเองมีความสัมพันธ์ทางลบกับการบริโภคเครื่องดื่มผสมแอลกอฮอล์ โดยสภาวะของแบบแผนความคิดเป็นตัวแปรส่งผ่านมีเพียงบางส่วน (TE = -.295, DE = -.252, IE = -.043) ส่วนแบบแผนความคิดกลุ่มการตั้งมาตรฐานสูงเกินควรพบว่าไม่มีความสัมพันธ์กับการบริโภคเครื่องดื่มผสมแอลกอฮอล์

ผลการศึกษาแสดงให้เห็นว่าการแบบแผนความคิดที่ต่างกันมีกระบวนการของแบบแผนความคิดที่แตกต่างกัน การออกแบบโปรแกรมการลดปัญหาการบริโภคเครื่องดื่มผสมแอลกอฮอล์ในนักศึกษาอาจจะนำแนวคิดเรื่องของแบบแผนความคิดและสภาวะของแบบแผนมาคิดมาร่วมพิจารณาด้วย ทั้งนี้ผู้วิจัยได้อภิปรายถึงการนำการศึกษาไปใช้ทั้งในทางทฤษฎีและทางปฏิบัติต่อไป

CONTENTS

CONTENTS (cont.)

LIST OF TABLES

LIST OF TABLES (cont.)

LIST OF TABLES (cont.)

LIST OF FIGURES

CHAPTER I
INTRODUCTION

Background and significance of the research problem

Alcohol use among college students is a major public health concern. In 2000, the U.S. Surgeon General and the U.S. Department of Health and Human Services (USDHHS) stated that college drinking is a national problem and had singled out binge drinking among college students for a specific target reduction. (U.S. Department of Health and Human Services., 2000) Other countries in Europe and Asia also acknowledged that heavy episodic drinking among college students is an important issue gained national recognition. (Task Force on College Drinking, 2002) In Thailand, the Center for Alcohol Studies (2010) also indicated that alcohol use is an important problem facing the country, especially drinking among children and adolescents. Although several prominent organizations and institutes have made efforts to create an understanding of the college drinking phenomena and have developed specific interventions for tackling such problems, college drinking has not been successfully reduced.

Alcohol is the most common psychoactive drug used by college students, and is one of the leading causes of death and injuries in individual under 21 (Advisory Council on the Misuse of Drugs, 2006; Institute of Medicine, 2004). The Center for Alcohol Studies (2010) reported that there have been two hundred and sixty thousand new drinkers each year. Corresponding with the findings of the Epidemiology of Mental Disorders Nation Survey 2008 (Sornpaisarn, Kaewmungkun, & Wathanaporn, 2010), the alcohol consumption rates in Thailand consistently increased; between 2001 and 2008, the prevalence of 15-to-19-year-old adolescents who drink alcohol increased from 4.6% to 8.0%. Also, the prevalence of 20-to-24-year-old adults drinking alcohol increased from 15.7% to 21.6%. These increases were higher than the rates of other age groups. Moreover, 23% of students aged 15-24 (5.3 million individuals) can be categorized as having problem with hazardous drinking and

alcohol use disorder. The The Administrative Committee of Substance Abuse Academic Network (2008) indicated that 22.2% of individuals aged between 12-24 were hazardous drinkers. Consistent with finding of Aekplakorn (2010), individuals aged 15-29 had a chronic risk of using alcohol (drinking alcohol more than 40 grams per day in male, 20 grams in female) and had the highest rate of acute risks (more than 5 standard drinks per day in male); especially students from the northern region who drink more than students from other regions. This drinking pattern was associated with negative consequences. (Correia, Murphy, & Barnett, 2012; Perkins, 2002)

Excessive alcohol use among university students causes several adverse consequences, such as physical illnesses, high risk behaviors, academic impairments, and secondhand consequences. Physical illnesses could be short-term or long-term. For short-term illnesses, students often have hangover, nausea or vomiting as a result of alcohol poisoning. Moreover, long-term use of alcohol decreases the bodily immune system causing students who frequently drink to have less resistance to other illnesses (Perkins, 2002). Researchers indicated that alcohol use increased the chances of engaging in risk behaviors; for example, unintended and unprotected sexual activity (Cooper, 2002), quarrelsome and physical fight (Giancola, 2002), and driving while intoxication (Perkins, 2002). Alcohol consumption, furthermore, leads to academic impairments, such as missing classes, getting behind, failing exams, receiving low grades. Alcohol-related problems are not only inflicted on students with drinking behaviors but also inflicted on other people. Physical violence, property damage and vandalism (Perkins, 2002) sexual violence and rape victimization (Abbey, 2002) are examples. The study of Wechsler et al. (2002) demonstrated that the negative consequences of alcohol drinking consistently increased. The finding revealed that, from 1991 to 2001, the ratio of university students confronts with alcohol-related problem went up 1.28 times. Similarly, Hingson, Heeran, Winter, and Wechsler (2005) estimated more than 1,700 undergraduate students in the United State died yearly, around 500,000 people were injured due to consequences from alcohol intoxication, and more than 600,000 became victims of physical fights, or sexual violence. These adverse consequences tended to increase every year. In Thailand, several institutes, namely, the Center on Alcohol Studies, the Thai Health Promotion Foundation, the Ramajitti Institute become aware of drinking problems among college

students and subsequently conducted researches and developing surveillance system. For instance, the study of Assanangkornchai, Mukthong, and Samangsri (2008), and the Ramajitti Institute (2007) developed a training program for teachers, public health technical officers to monitor alcohol use and its negative consequences among students. However, there had no prominent institute which is specifically responsible to target and monitor drinking behaviors in this population, unlike some institutes and projects in U.S.A. such as Task Force on College Drinking, the Harvard School of Public Health College Alcohol Study, the Core Institute Southern Illinois University, which were established to deal with college drinking problems.

In order to reduce the alcohol-related problems of university students, it is necessary to develop the advanced understanding of college drinking phenomena in particular. Numerous researches revealed that drinking patterns among university students differ from other populations. It was found that, during high school, students who will have attended in university have lower rates of alcohol consumption and other drug use than student who not entering in university. However, after have they enrolled in university, they tended to have higher rate of alcohol use, and engage in risker alcohol consumption than non-university peers (Schulenberg & Maggs, 2002; Wicki, Kuntsche, & Gmel, 2010). It is because the university years are a transitional period involving multiple adjustments including a separation from their family and change their living situation, an exploration of new social relationship and involvement in intimate relationship, an identity development and consolidation, etc. Moreover, alcohol use and heavy drinking behavior are culturally embedded in university life. Alcohol is used in university activities and context for many reasons; for instance, to reduce social anxiety in social situation, to feel comfortable in social gathering, to enhance fun and social gathering in parties and social events, to cope and relief stress from academic and interpersonal problems (Colby, Colby, & Raymond, 2009; Task Force of the National Advisory Coincil on Alcohol Abuse and Alcoholism, 2002). These developmental and university contextual magnify existing vulnerabilities and risk factors of individuals in adjustment and using alcohol (Schulenberg & Maggs, 2002).

A number of scholars conducted a research to investigate factors causing alcohol use among university students. The literature review indicated that

"personality" is a one of the risk factors related to alcohol use. Empirical research on college drinking found that some personality traits, such as sensation seeking, impulsivity, associated with greater quantity and frequency of alcohol consumption (Kuntsche, Knibbe, Gmel, & Engels, 2006; Kuntsche, von Fischer, & Gmel, 2008). Additionally, it was found that people with substance use disorder also suffer from personality problems or diagnosed with a personality disorders (McGinn, Young, & Sanderson, 1995; Verheul, 2001; Welch, 2007). According to previous researches, such trait theory as Five Factor Model was frequently used to conceptualize the relationship between personality and alcohol use. Nonetheless, some personality psychologists criticized trait theories as biological-based personality theory, which had 2 essential drawbacks. Firstly, biological-based personality theory overlooks childhood experiences and parenting styles which have affect individual's personality and adjustment. Secondly, biological-based personality theory underestimates the influence of social context and situational factors to one's behaviors. All of these demonstrated the limits to generalization of research findings into practices (Hergenhahn & Olson, 2007). In addition, due to the fact that personality is hard to change, there were efforts to investigate other factors moderated the effect of personality to alcohol use. The cognitive vulnerability is an another factor bring the attention into field of alcohol studies, e.g. Corte and Zucker (2008) determined self-schemas, which have develop throughout childhood experience, as a dependent variable to predict early drinking onset, and as a moderating variable to moderate the relationship between antisocial personality disorder and early drunkenness. Schema theory, developed by Young, Klosko, and Weishaar (2003), is one of theories that focuses on such individual factors as cognitive vulnerability, and mentions the influences of social context affecting drinking behaviors as well.

Schema theory has a basic assumption that characterological problems and maladaptive behaviors were a result of interaction between 3 constructs: early maladaptive schema (EMS), maladaptive coping styles, and schema modes. Early maladaptive schema (EMS), as defined by Young et al. (2003), is a broad, pervasive theme or pattern comprised of memories, emotions, cognition, and bodily sensation, and relates to the self and relationships with others. EMS is primarily developed from childhood and adolescence and remains throughout an individual life, and that is

dysfunctional to a significant degree. According to aforementioned definition, EMS is stable and enduring construct, which can be compared with personality trait (Thimm, 2010).

Researchers found that EMS correlated with alcohol and substance use among several groups of population. For instance, Muris (2006) investigated relationship between EMS and psychopathological symptoms, including substance use, in non-clinical adolescents. The findings revealed that substance use can be predicted by some EMSs, namely, Failure, Dependence, and Subjugation. The relationship between EMS and alcohol use also found in other population such as clinical population (Shorey, Stuart, & Anderson, 2012, 2013). However, according to author knowledge, there was no a study that investigated the pathway linking EMS and alcohol use.

Schema mode is another construct, which is introduced by Young. Schema modes are defined by the moment-to-moment emotional states and coping responses which could be adaptive or maladaptive. According to Young, Arntz, and Atkinson (2007), schema modes can be categorized into 4 domains. Firstly, Child mode is innate and the inborn emotional range of human beings, consisting of Vulnerable Child, Angry Child, Enraged Child, Impulsive Child, Undisciplined Child, and Happy Child. Secondly, Maladaptive Coping mode represents individuals' attempts to adapt to living with unmet emotional needs in a harmful environment, which are composed of Compliant Surrender, Detached Protector, Detached Self-Soother, Self-Aggrandizer, and Bully and Attack. Thirdly, Dysfunctional Parent mode is characterized by the internalization of the way their parents treat them and becoming their own parents, which are comprised of Punitive Parent, and Demanding Parent. Finally, Healthy Adult mode is an appropriate emotional state and adult function. Schema modes could be adaptive and maladaptive; therefore, psychological healthy individuals and unhealthy individuals use schema modes. However, schema modes often used by a healthy individual are more adaptive, flexible, and appropriate with the situations.

People with different EMS tend to operate unique schema modes. Lobbestael, Van Vreeswijk, and Arntz (2008) indicated that people with different personality displayed the characteristics of schema modes significantly different from

each other. People with personality disorders, also, had significantly high maladaptive modes and had lower a healthy adult mode than non-clinical groups. Together with the study from de Rooyse Wissel, a Dutch forensic psychiatric center (Kersten & van de Vis, 2012), the research finding provided the fact that people with different personality disorders exhibited different functions as well as patterns of substance use. In term of schema theory, different functions and patterns of substance use referred to different schema modes; for instance, reducing negative feeling as Self-Soother modes, increasing self-esteem and sense of superior as Self-Aggrandizer mode. All of these lead to the hypothesis that schema mode could possibly be a mediating factor which links between EMS and alcohol use.

According to the literature review, there is still no studies investigating the relationship among these three factors; EMSs, schema modes and alcohol use both clinical population and non-clinical population. Furthermore, in Thai society, research on alcohol and substance use which applied schema theory has not been apparent yet. Thus, the purpose of this study was to develop and to investigate the structural relationship among early maladaptive schemas (EMSs) and alcohol use among college students, which the schema modes were served as a mediating factor. For this study, the authors employed a structural equation modeling (SEM) technique for testing the structural relationship. According to Ball (1998, 2005, 2012), people with different characteristic and its pathway to substance use need difference of care and intervention. Therefore, the better understanding of the effect of EMSs on alcohol use and their specific mechanisms will be truly beneficial to practitioners to apply the finding for developing a more effective intervention for college drinking reduction or alcohol prevention program. Furthermore, the findings will help practitioners to address specific pathways leading to alcohol use, therefore they can provide more specific intervention tailored to the student based-on EMS and its mechanism.

Research question

The main research question of this study is:

What is the structural relationship among early maladaptive schemas, schema modes, and alcohol use?

Sub research questions are:

1. What are the effects of early maladaptive schemas on alcohol use among college students?

2. Is there a specific relationship between certain early maladaptive schemas and schema modes?

3. How are early maladaptive schemas and alcohol use linked?

Research objectives

The objective of this study was to develop and examine the structural relationship among early maladaptive schemas and alcohol use among college students, which schema modes were identified as mediating factors.

Contribution of the study

The findings of the current study are expected to contribute the significant knowledge and insight on college drinking phenomena as follow;

For theoretical basis, the findings from this study would provide the better understanding of effect of EMSs on alcohol use among college students, which a number of studies focusing on the issues are limited. Moreover, the current study aimed to examine the mediating role of schema modes, which would extend and enhance our theoretical knowledge of application of schema theory for conceptualizing college drinking phenomena. Furthermore, the findings of the current study would provide groundwork for practice and facilitate research activities of schema therapy in Thailand.

In terms of practical implication, the findings from this study would elucidate the specific pathways leading to alcohol use of each college student with different EMS, which truly beneficial for practitioners to select or develop specific intervention tailored to the students. Also, the findings would definitely be useful for developing a more effective primary or secondary prevention program for college drinking.

Scope of this study

The population of this study was limited to undergraduate student registered in the academic year 2014-2015 in Chiang Mai, Thailand.

With regards to Young's schema theory which was used to conceptualize alcohol use among college students, the variables of this study were limited to the extent of these construct namely as presented below.

1) Exogenous variables

1.1 Early maladaptive schema, which can be categorized into 5 domains

- *Disconnection and Rejection domain:* Abandonment, Mistrust, Emotional Deprivation, Defectiveness, Social Isolation/Alienation
- *Impaired Autonomy and Performance domain:* Dependence, Vulnerability to Harm, Enmeshment, Failure
- *Impaired Limits domain:* Entitlement, Insufficient Self-Control
- *Other-Directedness domain:* Subjugation, Self-Sacrifice, Approval Seeking
- *Overvigilance and Inhibition domain:* Pessimism, Unrelenting Standard, Punitiveness

2) Endogenous variables

2.1 Schema modes, which can be organized in 4 domains

- *Child mode:* Vulnerable Child, Angry Child, Enraged Child, Impulsive Child, Undisciplined Child, and Happy Child
- *Maladaptive Coping mode:* Compliant Surrender, Detached Protector, Detached Self-Soother, Self-Aggrandizer, and Bully and Attack.
- *Dysfunctional Parent mode:* Punitive Parent, and Demanding Parent
- *Healthy Adult mode*

2.2 Alcohol use

Operation definition

Early maladaptive schemas

Early maladaptive schemas (EMSs) are defined as a broad, pervasive pattern consisting of memories, emotions, cognitions, and bodily sensation, which determine the relationships of oneself with other. According to Young et al. (2003)'s theoretical model, there are 18 EMSs, namely:

- *Abandonment.* The beliefs that one's significant others will not be able to continue providing emotional support, and protection due to their emotional instability and unreliability.
- *Mistrust.* The beliefs that others will hurt, abuse, humiliate, cheat, lie, manipulate, or take advantage.
- *Emotional Deprivation.* The beliefs that one's desire for emotional support will not adequately provided by others.
- *Defectiveness.* The beliefs that one is defective, bad, unwanted, inferior, or invalid in important respects or that one would be unlovable to significant others if exposed.
- *Social Isolation.* The beliefs that that one is isolated alienate form others.
- *Dependence.* The beliefs that, without helping form others, one is incompetent to handle everyday life responsibilities. They also often express themselves in helpless manner.
- *Vulnerability to Harm and Illness.* The beliefs that imminent catastrophe will strike at any time and that one will be unable to prevent it.
- *Enmeshment.* The excessive emotional involvement with one or more significant others.
- *Failure.* The beliefs that one will inevitably fail, or is fundamentally inadequate relative to their peers in areas of achievement.
- *Entitlement.* The beliefs that one is superior to others, and entitled to special rights and privileges

- *Insufficient Self-Control.* The beliefs that one has difficulty controlling oneself and has low frustration tolerance.
- *Subjugation.* The surrender of control to others, and suppress one desires or feelings in order to avoid anger, retaliation or abandonment.
- *Self Sacrifice.* The excessively concentration on the needs of others at the expense of their own gratification
- *Social Approval.* The excessive need of approval and recognition from others.
- *Negativity.* The over concentration on negative aspects of life, whereas the positive aspects of life are minimized or neglected.
- *Emotional Inhibition.* The inhibition of one's spontaneous actions and feeling in order to avoid disproval by others or losing control of one's impulses.
- *Unrelenting Standards.* The determination to achieve high standards of performance in order to avoid criticism.
- *Punitiveness.* The belief that people making mistakes should be harshly punished. They have difficulty forgiving other people who are committed mistakes.

For this study, EMSs was measured by Young Schema Questionnaire-3 short form (YSQ-3s) developed by Young et al. (2003). This instrument is a 90-item self-report instrument for assessing 18 early maladaptive schemas. Each EMS has 5 items with a 6-step Likert scale ranging from 1 (*completely untrue of me*) to 6 (*describes me perfectly*). A higher score indicates a higher level of the respective EMS.

Schema modes

Schema modes are defined as the moment-to-moment emotional states and coping responses, which are triggered by a situation that each individual is oversensitive at any given point in time. According to Young et al. (2007), there are 18 EMSs, namely:

- *Vulnerable Child.* The emotional states of frightened, sad, overwhelmed, or helpless.
- *Angry Child.* The emotional states of angry when their core emotional needs are not being met.

- *Impulsive Child.* The act of impulsivity to pursue pleasure and fill need regardless of limits or concern for others.
- *Undisciplined Child.* The low tolerance of frustration and low self-control of oneself to finish routine and boring tasks.
- *Happy Child.* The emotional states of loved and content due to one core emotional needs are met.
- *Compliant Surrender.* The behaviors of obedient, allowing others to abuse or neglect one in order to avoid retaliation or conflict.
- *Detached Protector.* The cutting of strong feeling and withdrawal from social contacts.
- *Enraged Child.* The emotional states of enraged and lose control, which lead to lose their control and injure other or objects.
- *Self-Aggrandizer.* The feeling of entitled to special rights and the behaviors of doing everything they want without the consideration for others.
- *Bully and Attack.* The behaviors of aggression, intimidation, or threats towards others in order to prevent one from being controlled or hurt.
- *Punitive Parents.* The emotional states of angrily criticize, punish or restricts oneself or others for expressing needs or making mistakes. This mode often found with Punitiveness and Defectiveness.
- *Demanding Parents.* The identification of their parents indicating by putting the pressure on oneself or others to achieve unrealistically high expectation.
- *Healthy Adult.* The positive and neutralized thoughts and feelings about themselves, leading to healthy relationships and activities.

For this study, schema modes was measured by Schema Mode Inentory, developed by Young et al. (2007). It consists of 118 items aimed to assess 14 schema modes. The items of SMI were 6-step Likert Scale ranging from 1 (*never or almost never*) to 6 (*All of the time*). A higher score indicates a more frequency of utilization of the respective schema modes.

Alcohol use

Alcohol use is defined as the drinking behaviors of individual in past year. For this study, the alcohol use consist of quantity of use, frequency of use, and binge drinking behavior. It was measured by alcohol use questionnaire, consisting of 3 items. The first item aims to assess frequency of use (How many days on average in a month did you drink alcoholic beverages?). This second aims to assess quantity of use (How many standard drinks on average did you drinking in an occasion?). The third question aims to assess binge drinking (How many times on average in a month did you drink alcohol beverages 5 standard drinks or more in 2 hours (for men) or 4 standard drinks or more in 2 hours (for women)?). These items were Likert scale ranged from 1 to 9. The total score of alcohol use is estimated by confirmatory factor analysis procedure. A higher score indicates a high rate of alcohol use, which may lead to alcohol-related problems.

CHAPTER II
LITERATURE REVIEW

The objective of this study was to develop and validate the structural relationship early maladaptive schemas (EMS) and alcohol use among college students with considering the mediating role of schema modes. Theories, conceptual framework, and literature related to this study were reviewed and are presented in five parts as follows:

1. Alcoholic beverages and alcohol use among college students
2. Theories of college students drinking and relevant research
3. Schema theory
4. Research related to schema theory
5. The conclusion based on literature review and gap of knowledge

2.1 Alcoholic beverage and alcohol use among college students

2.1.1 Definition of alcohol and alcoholic beverages

World Health Organization (http://www.who.int/substance_abuse/terminology/who_lexicon/en/) defines alcohol in chemical terminology as “a large group of organic compounds derived from hydrocarbons and containing one of more hydroxyl (-OH) groups. Ethanol (C2H5OH, ethyl alcohol) is one of these classes of compounds, and is the main psychoactive ingredient in alcoholic beverages.” Alcoholic Beverage Act B.E.2493 defines alcoholic beverages as “substances or mixture which contain consumable alcohol or liqueur which is not consumable on its own but becomes consumable when mixing with water or other liquids.”

As defined by WHO and Alcoholic Beverage Act B.E.2493, the definition of alcohol beverages is grounded exclusively on chemical and medical perspectives. Dietler (2006) stated that the definition of alcoholic beverages as chemical

composition and properties of ethanol were formalized only in the 20th century, whereas archaeometric techniques demonstrated the earliest alcohol production dating back to 7th millennium B.C. Hence, the definition of alcohol beverages is not universally shared across time and social context. Anthropologists believed that the concept of alcohol is a culturally specific and astonishing variety, which could not be reducible to a uniform chemical substance with physiological effects. The classification, inclusion, and exclusion of alcohol beverages are always controversy. For instance, Young Haitians did not consider two rum-based drinks, called *kremas* and *likay,* to be alcohol beverages (Dietler, 2006). Similarly, a cough syrup, which content alcohol, is classified as medicine. In Thai context, Sherer and Wonguparaj (2007) found that the concept of alcohol is boarder than ethyl alcohol. In terms of social meaning, alcohol is viewed as a symbol associated with masculine identities, social relationships, and social assertion, etc. It can be concluded that when conducting a literature review or survey, researchers should take such variations into consideration.

2.1.2 Alcohol addiction and alcohol use disorder

The starting point for a view of alcohol use as addictive behaviors existed as early as the beginning of the 17th century. John Downame observed and described the excessive drinking behaviors of his parishioners, who had drunk for a long times and lost their control over alcohol (Orford, 2001). Subsequently, experts and psychologists have tried to understand alcohol addiction. Generally, alcoholism is a term that refers to chronic and continual consumption, inability to control over drinking, and preoccupation with alcohol. Until the 1979, World Health Organization decided to use the term of alcohol dependence instead (World Health Organization, http://www.who.int/substance_abuse/terminology/who_lexicon/en/).

In the United States, awareness of alcoholism has been documented for a long time. Initially, the first and second editions of *American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders* (DSM-I and DSM-II) classified alcoholism and drug addiction as from of personality disturbance, sociopathic subtype. Then, DSM-III reclassified drug addiction as Substance Use

Disorder, a new category separating from personality disorders. This is because the failure to identify a unique addictive personality type (Ball, 2004; 2005).

According to the DSM-IV-TR, alcohol use disorder can be divided into two categories: alcohol abuse and alcohol dependence. The study of Dawson, Grant, S., and Chou (2005) examined the prevalence of alcohol abuse and alcohol dependence among college population. Approximately 7.7 percent of college students met the criteria for alcohol abuse, whereas 10.9 percent met the criteria for alcohol dependence. Contrary with the study of Aertgeerts and Buntinx (2002), the prevalence rates of alcohol abuse and alcohol dependence exceeded 14.0% and 3.6% respectively. Some researchers noticed that the variation of prevalence rate across studies was due to the criteria of DSM-IV-TR for alcohol abuse and alcohol dependence, which were inappropriate when applied to adolescents and college students. Gonet (1994) explained that the progression of alcohol use disorder among adolescents differs from adults. Thus, it is difficult to differentiate alcohol use, alcohol abuse and alcohol dependence in adolescents. Harrison, Fulkerson, and Beebe (1998) stated that the structures of alcohol abuse and dependence were not supported. In reality, alcohol problem occurred in broad spectrum, ranging from occasional binge drinking to alcohol abuse or dependence. As well as the study of Hagman and Cohn (2011), he investigated the dimensionality of the criteria of DSM-IV-TR for alcohol use disorder by item response theory (IRT) analyses. The findings noticed that a single-latent model of alcohol severity indicated the best fit, whereas the criteria of alcohol abuse and alcohol dependence were mixing along the alcohol use disorder severity continuum. Hence, Hagman and Cohn (2011) concluded that the alcohol abuse and alcohol dependence should be combined into a single disorder to reflect a continuum nature of alcohol use.

With considerable overlap between criteria of alcohol abuse and alcohol dependence, the American Psychiatric Association decided to integrate two distinct disorders into a single disorder called alcohol use disorder, issued the 5th edition of the *Diagnostic and Statistical Manual of Mental Disorder (DSM-5)* (American Psychiatric Association, 2013). The criteria of alcohol use disorder are presented as follows;

Alcohol Use Disorder

A] A problematic pattern of alcohol use leading to clinically significant impairment or distress, as manifested by at least two of the following, occurring within a 12-month period:

1. Alcohol is often taken in larger amounts or over a longer period than was intended.

2. There is a persistent desire or unsuccessful efforts to cut down or control alcohol use.

3. A great deal of time is spent in activities necessary to obtain alcohol, use alcohol, or recover from its effects.

4. Craving, or a strong desire or urge to use alcohol.

5. Recurrent alcohol use resulting in a failure to fulfil major role obligations at work, school, or home.

6. Continued alcohol use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of alcohol.

7. Important social, occupational, or recreational activities are given up or reduced because of alcohol use

8. Recurrent alcohol use in situations in which it is physically hazardous

9. Alcohol use is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by alcohol

10. Tolerance, as defined by either of the following:

a. A need for markedly increased amounts of alcohol to achieve intoxication or desired effect. b. A markedly diminished effect with continued use of the same amount of alcohol.

11. Withdrawal, as manifested by either of the following:

a. The characteristic withdrawal syndrome for alcohol (refer to DSM-5 for further details).b. Alcohol (or a closely related substance, such as a benzodiazepine) is taken to relieve or avoid withdrawal symptoms.

Specify current severity:

Mild: Presence of 2-3 symptoms.

Moderate: Presence of 4-5 symptoms.

Severe: Presence of 6 or more symptoms.

The studies on prevalence rate for alcohol use disorder among college population were limited due to the DSM-5 criteria for alcohol use disorder have only been used since 2013. However, American Psychiatric Association (2013) estimated that the prevalence of this disorder is 4.6% among 12-to 17-year-olds and 8.5% among adults age 18 years and older in the United States.

2.1.3 Alcohol use among college students

Awareness of alcohol use among college students is not new. At least 50 year, there is documentation about the interest in college drinking. In 1953, Straus and Bacon published their research, *Drinking in College*, which brought college drinking to public's attention. Afterwards, the progress in understanding the college drinking issues has gradually been made through research. In 1976, the National Institute on Alcohol Abuse and Alcoholism (NIAAA) published the first report on alcohol misuse by college students. This report brought the awareness of alcohol use and misuse on college campus to NIAAA and the public. The annual nationwide surveys and several studies have been conducted for advancement of understanding of alcohol abuse and alcohol dependence. (Correia, Murphy, & Barnett, 2012) In 1998, the NIAAA established the Task Force on College Drinking. Two panels of Task Force on College Drinking were formed to address the problems. The first panel addressed the contexts which drinking occurred and its consequences and the second panel addressed treatment and prevention (Correia et al., 2012; Goldman, 2002). It was found that college alcohol users differ from adults in several ways. The alcohol consumption and drinking patterns, and its consequence specific for this population are presented in the following sections.

2.1.3.1 Alcohol consumption and drinking patterns

In United States, alcohol consumption levels increase dramatically during teenage to reach lifetime peaks during young adults (ages 18 to 24). The prevalence rates of heavy drinking in college students were higher than other populations (Carter, Brandon, & Goldman, 2010). O'Malley and Johnston (2002) conducted a comprehensive review of literature of five large national studies on

college drinking, consisting of (1) College Alcohol Study (CAS), Harvard School of Public Health, (2) the Monitoring the Future (MTF), University of Michigan, (3) the Core Institute(CORE),Southern Illinois University, (4) the National Household Survey on Drug Abuse (NHSDA), Substance Abuse and Mental Health Services Administration, and (5) the National College Health Risk Behavior Survey (NCBRBS), Centers for Disease Control and Prevention. The results from these national surveys consistently indicated that alcohol use rates among college students were very high. Approximately two of five American college students had binge drinking behavior in the past 2 weeks. The results from longitudinal study also suggested that, while in high school, individuals who had decided to enroll in college had lower rates of heavy drinking than individuals who would not attend college. After high school, although both group increased their heavy drinking, the rates of heavy drinking among college group were increased distinctly more than non-college group counterpart. Consistent with Wicki, Kuntsche, and Gmel (2010), the same patterns of heavy drinking were identified among European students.

Arnett (2000) proposed that high rates of heavy drinking among college students relate to developmental process of this age group. The term emerging adulthood was proposed for this period of development (ages 18 to 25). He explained that in industrialized countries, a transition period from adolescence to adulthood is prolonged due to higher education. The developmental period of emerging adulthood is characterized by the age of identity explorations, instability, self-focus, feeling in-between, and possibilities. Furthermore, individuals who enrolled in a university tend to confront with several challenges, such as the move, separation from their families, meeting new friends, academic responsibilities. The college students also perceived a high level of freedom from social roles. Taking together, the specific natures of emerging adults made drinking patterns among college students distinct from other populations. In college contexts, alcohol is sometimes used as a social lubricant for reducing social anxiety and enhance social gathering; for example, freshman orientations, student activities, drinking games. Hence, the tradition of drinking has develop into a kind of culture entrenched all around college environments and hand down through generations (Colby, Colby, & Raymond, 2009; Task Force of the National Advisory Coincil on Alcohol Abuse and Alcoholism, 2002).

Although full criteria of alcohol use disorder are not met, excessive alcohol use places students at high risk situations. Researchers defined a potentially dangerous drinking practice frequently found among college students as "binge drinking", which is characterized by consuming five drinks or more in a row for men and four drinks or more in a row for women over a short period of time (2-3 hours). Binge drinking is associated with negative consequences. Wechsler et al. (2002) found that 44 percent of American college students have engaged in binge drinking at least once in a two-week period. Approximately 23 percent of the college students had binge drinking behaviors more than 3 times during the past 2 weeks, which could define as frequent binge drinkers. Drinking behaviors which met the criteria of alcohol use disorder also found in college students consistent with the studies of Aertgeerts and Buntinx (2002) and Dawson et al. (2005).

In Thailand, the Epidemiology of Mental Disorders National Survey 2008 (Sornpaisarn, Kaewmungkun, & Wathanaporn, 2010) indicated that prevalence of alcohol use disorders among youth and adolescence aged between 15 and 24 years was high as 23%. Consistent with the The Administrative Committee of Substance Abuse Academic Network (2008) prevalence of alcohol use disorder among youth and adolescence aged between 12 and 24 years was 22.2%. Lapyai (2006) surveyed drinking behaviors from three universities in Bangkok. It was found that 72.9% of participants drank alcohol at least once a week. Sakulsriprasert (2008) conducted a survey of drinking behaviors among college students in Chiang Mai. Approximately 60 percent of participants have drunk alcohol at least once within the past month. The percentages of binge drinking and high-risk drinking were 45.4 and 34.1 respectively.

Drinking patterns of individuals are influenced by individual factors as well as sociocultural factors. For individual factors, the numerous studies have been concerned with personality and its association with alcohol use. Although no evidence supported the unique alcoholic personality, a set of personality characteristics have been found to be closely related to heavy drinking and alcohol-related problems among college students. Hittner and Swickert (2006) conducted a meta-analytic review to investigate the relationship between sensation seeking and alcohol use. The analysis of 61 studies indicated a small to moderate effect size (r_w =

.263) between sensation seeking an alcohol use. Individual with high sensation seeking tend to seek out varied and novel experiences and sensations. The novel experience may involve with participation in risky physical activities or potentially addictive such as substance use. Disinhibition was the component of sensation seeking which was most strongly associated with alcohol use (r_w = .368). Disinhibition is characterized by behaviors with less constrained by social expectation and norms. Individual with this trait tend to engage in both gambling and substance use as well as high risk sexual behaviors. Other individual factors affecting drinking pattern include alcohol expectance, drinking motive, alcohol-related self-efficacy, etc. (Cooper, Russell, Skinner, & Windle, 1992). Many scholars determined the relationship between individual factors and heavy alcohol consumption by a self-selection process, i.e. college students who drink heavily are more likely to socialize with heavy drinking peers or to find themselves in heavy drinking contexts.

Sociocultural factors also influence drinking patterns of college students. Wicki et al. (2010) stated that a prevalence of regular alcohol consumption and risky single occasion drinking of European university students was higher than of US and Canadian university students. This is because the legal drinking age range from 16 to 18 in most European countries, whereas in the US is 21. Iwamoto, Corbin, and Fromme (2010) identified that drinking pattern of Asian American was the late onset, which their alcohol consumption tend to increase during end of junior year. Although overall rates of heavy-episodic drinking of Asian American students were lower than other racial students, the heaviest drinker of Asian American reported comparable rates of heavy-episodic drinking to other high-risk groups in same period of development. In addition to policy and race, university campus culture also influenced the use and abuse alcohol as it interacts with other individual factors. For instance, it was found that students who live in a Greek house had higher rate of alcohol consumption, heavy-episodic drinking, and negative consequences than students in general. Furthermore, fraternity and sorority leaders used alcohol more than members and nonmembers of Greek house. These leaders were participating in setting drinking norms for their groups (Presley, Meilman, & Leichliter, 2002; Wicki et al., 2010). Additionally, college sport culture contributed individuals' drinking patterns. Universities with a well-known sport team had higher

rate of drinking due to the involvement from alcohol industry sponsors in sport events. College students tend to consume alcohol on pre-game parties or while watching collegiate athletics. College athletes also tend to drink more than students who did not enroll in campus-based sports (Presley et al., 2002; Task Force of the National Advisory Coincil on Alcohol Abuse and Alcoholism, 2002).

As mentioned above, several studies had attempted to understand the influences and their interactions between individual factors and sociocultural factors. Demers et al. (2002), investigated the interaction between drinking situations and individual characteristics by multilevel analysis among Canadian college students. The results revealed that the drinking situations (e.g., the circumstance in which drinking occurred, the location where the drinking took place, the day of the week, the number of drinking partners) explained 25.2% for alcohol intake per occasion, and the individual characteristic (e.g., gender, perceived campus drinking norms, activities preference, year of study, living arrangement) accounted for 30.7%. Juntachum (2006) used meta-analysis to synthesize research relevant to smoking and alcohol use. It was found that the effect sizes of individual factors (e.g., knowledge, attitude, conformity, self-control) were larger than of external factors (e.g., economic variables, peer environments, school environments) ($r = .32$ and $.18$ respectively).

All in all, it can be concluded that there is no single factor accounting for the variation in drinking patterns and alcohol-related problems among college students. Research on interaction and pathway between risk factors is pertinent to unfold the complexity of college drinking phenomena.

2.1.3.2 Negative consequences of college drinking

Excessive drinking among college students is associated with a variety of negative consequences, which can be divided into 3 categories as presented below.

2.1.3.2.1 Damage to self

Academic performance. The results from several studies revealed that drinking negatively correlated with academic impairment. Students who drank heavily reported academic impairments due to their drinking such as hung over in class, falling behind, missing classes, poor performance on exam or paper, receiving lower grades. The study of Wechsler et al. (2002) showed that 29.5%

of students who drank alcohol had missed a class, and 21.6% had got behind in college work. Corresponding with the study of Presley and Pimentel (2006), binge drinkers and frequency drinkers were 5.9 times more likely than non-binge drinkers to receiving lower grade. Aertgeerts and Buntinx (2002) found that students with alcohol dependence failed in their first year more than students without alcohol-related problems 1.24 times.

Injury and death. Alcohol use is related to increased risk of injuries and deaths in a wide variety of situations. Hingson, Zha, and Weitzman (2009) reported that in the year of 2005, 599,200 U.S. college students were unintentional injured because of alcohol use. There were 1,533 alcohol-related traffic deaths. Furthermore, there were 3,392 alcohol-related non-traffic deaths such as burn/fires, cold/hyperthermia, drowning, falls, alcohol poisoning.

Unsafe sex. Alcohol use increase risk of engaging in unprotected sexual activities against sexually transmitted diseases or pregnancy. Cooper (2002) evaluated the empirical association between alcohol use and risky sexual activities. The finding suggested that drinking was strongly correlated with the decision to have sex and indiscriminate sexual activities (e.g., multiple partners). However, the relationship between alcohol use and unprotect sex was inconsistent across studies. It was also found that alcohol use increased the likelihood of acquaintance sexual assault and date rape (Abbey, 2002). Hingson et al. (2009) reported that 97,000 college students were victims of sexual assault due to drinking.

Memory. Heavy alcohol consumption can induce acute anterograde amnesia, which commonly call “black out.” Wechsler et al. (2002) reported 22% of students had experienced at least once in past year incident of having forgot what they did or where they were during drinking. In the long run, acute anterograde amnesia can lead to the more severe form of anterograde amnesia named Wernicke’s encephalopathy and Korsaoff’s syndrome.

Health outcomes. Alcohol consumption can cause poor health outcomes, bot short-term and long-term. Short term consequences experienced by college drinker could be hangovers, nausea, or vomiting. After heavy drinking, students reported that they spend their times 5 to 24 hours in recovery to normal functioning. Although incidents in campus health center were unfamiliar,

fatalities due to alcohol poisoning had been found. Long-term consequences of alcohol use among college students may include decreasing of the immune system function, which contributes to lowered resistance to common illnesses.

Legal repercussion. The study of Presley and Pimentel (2006) found that 8.5% of college students admitted the trouble with police or campus authorities due to a result from their drinking, for instance driving while intoxicated, public inebriation. The rate of legal repercussion was corresponded with the study of Wechsler et al. (2002), which reported at a rate of 6.1%.

2.1.3.2.2 Damage to others

The consequences of drinking are not limited to the heavy drinker themselves. Students enrolled in high rates of alcohol use experienced a large number of secondhand consequences.

Interpersonal and sexual violence. The systematic reviews conducted by Giancola (2002) explained that alcohol consumption, especially in heavy drinking, increased verbal and physical aggressive behaviors. It was also found that much of sexual victimization experience associated to the victim's alcohol consumption. Abbey (2002) reported that at least 50% of sexual assaults among college students related to alcohol use. Overall, Hingson et al. (2009) estimated that 696,000 of college students were physically attacked by another college drinkers, and 97,000 were victims of alcohol-related sexual assaults.

Properties damage and vandalism. As reported by Wechsler et al. (2002), 61% of students living in campus experienced interruptions in sleep and sleep because of other students' drinking. In the same study, it was found that 12% of college students claimed that their properties were damage by other students who had drunk alcohol. Additionally, more than one-half of college administrators reported that their institute faced a major problem with noise, vomit and unsightly litter, property damage and vandalism due to college drinkers.

1.3.2.3 Damage to the Institution

Alcohol consumption of college students affects not only students who drink and their peers, but it also affects the institutional cost and reputation. For the cost, the institution spends a lot of money to repair the properties vandalized by intoxicated students. Additionally, the prevalence rate of drop out and

academic failure as previously cited in academic impairment affect an institutional budget due to high attrition rates resulting in lost tuition revenues (Task Force on College Drinking, 2002).

For institutional reputation, the image of institute could be deteriorated by the involvement of intoxicated students in legal repercussion, accidents, or other alcohol-related activities. Moreover, the vandalism and property damage by intoxicated students also aggravate the relation between the institution and the surrounding community (Task Force on College Drinking, 2002).

As documented above, excessive alcohol use among college students is related to a variety negative consequences to themselves, others, and institutions. Excessive alcohol use continues to be a significant problem. All of these brought the attention on college drinking issues to the author's awareness. Next session, the author reviewed and discussed the major theories explaining college drinking phenomena as well as theirs empirical evidences and implications.

2.2 Theories of college students drinking and relevant research

From the literature review, there are several theories and approaches that can be used to study alcohol use phenomena among college students which can be classified into 3 groups; developmental theory, social norms theory, and personality theory.

2.2.1 Developmental theory and alcohol use among college students

The theory believes that "development" is one of risk factors leading to alcohol drinking among college students in both direct and indirect way. In each developmental stage, an individual encounters many developmental transitions. One has to try to get through these developmental turning points. The transition from high school student into college student is also considered a transitional period. Being in a university, a student has to confront many changes. For instance, being separated from family, meeting new friends, adapting to new education styles, becoming more mature like an adult, and adjusting to new life routines. This transitional period can encourage undergraduate students to drink alcohol more. The mechanism of the relationship

between transitional period and alcohol use can be explained in 5 models as described below (Correia et al., 2012; Schulenberg & Maggs, 2002).

Overload model is developed from cumulative stress theory. It believes that a great number of changes in a brief period of time in transitional period can make a student stressed out. If the degree of stress is higher than a student's ability to handle it, alcohol usemay be a selected mechanism to reduce the tension and pressure. In accordance to this model, to prevent a student from drinking alcohol, the intervention should decrease stressors and promote the student's problem handling statregies.

Development mismatch model is influenced by person-environment fit theory. This approach believes in a relationship between people and environment. Therefore, when a student starts a college life, he/she will have needs according to the development such as finding new friends, having more freedom, and prepareing for the labor market. If the university environment is suitable for an individual's needs, an individual will be able to adjust smoothly. On the other hand, if the environment mismatches individual's needs such as a highly competitive atmosphere causing untrustworthy relationship in a student who seeks for new friends, a student may seek alternative activities from this unsuitable environment like drinking alcohol with friends from outside of classroom to establish a bond with them. In order for administrators to prevent alcohol use, an intervention aiming to reduce the mismatch and broaden alternative contexts which matches with student's needs should be adopted.

Increased heterogeneity model is influenced by the combination of overload model and developmental mismatch model. It focuses more on individual differences. A student who already has had high vulnerability and emotional problems before entering university, the vulnerability and difficulties can be heightened when facing difficulties during transitional period. He/she often becomes stressed out and has adjustment problems more than other students. Alcohol drinking can be the negative reinforcement or coping to avoid the problems. Therefore, the intervention should promote a high-risk group and improve environment at the same time.

Transition catalyst model regards risky behaviors as normal and necessary in order to accomplish developmental transitions. Hence, risky behaviors can be both constructive and destructive. Alcohol drinking is positive reinforcement that

strengthens friendship bond among students that they can support each other and get through transitional period. However, it can affect student's safety, health, and academic performance. An intervention should design alternative activities that can replace risky behavior while have less drawbacks.

Heightened vulnerability to chance events model believes in interindividual differences in receptivity to chance events or the idea that each individual has uneven chances to experience situations. Also, an individual has uneven risks in each stage of life or intraindividual fluctuations in this receptivity. College life is transitional period with the change of environment and context which increases the tendency of a student's new behaviors for either exploring or learning the new environment. A student tends to seek and open for new experiences. Thus, university life can increase the chance for negative or risky behaviors like alcohol drinking. To prevent the problem, an intervention should raise the awareness of potential negative consequences and build up resiliency to prevent those negative outcomes.

These 5 models are only a set of an explanation of the relationship between environment and drinking behavior when a student transforms into an undergraduate student. Nonetheless, there are other aspects of development relevant to alcohol use among college students. For example, physical changes, the need to be adult and attractive, cognitive change, the idea that one is invulnerable that no danger will happen to him/her (Correia et al., 2012). Moreover, the theories which may affect this relationship can be cognitive and brain development such as the change of sleep cycle causing the use of alcohol to treat the insomnia or an individual with decision or executive function problems may have a risk from negative consequences of alcohol drinking (Spear, 2002).

Despite of the fact that developmental theory provides specific and direct solutions in alcohol-related problems among college students, it omits to give a clear explanation about individual differences which leads to vulnerability of alcohol drinking or its drawbacks. Also, although it states an influence of environment as a causing factor of alcohol drinking, it does not explain the mechanism when an individual adopts drinking value as his/her own value.

2.2.2 Social norms and alcohol use among college students

In addition to transitional period, some scholars believe that alcohol use is a culture passed on from generation to generation. In other words, alcohol use relates to social norms of undergraduate students. Social norms are a group's attitude, expectation, and practice. An individual inclines to adopt the group's attitude and expectation and behave accordingly to social norms. Similarly, social conformity can be caused by group pressure and social influence.

For the social norms which correlate to alcohol use, Borsari and Carey (2001) reviewed literature and found that the social norms had an effect on student's drinking behavior. The social norms make student view alcohol drinking normal and acceptable. Also, a student tends to incorrectly perceive the quantity of drink. While friends' drink is overly greater than reality, one's drink is excessively lower than reality. This cause a student to drink a greater amount of alcohol (Ham & Hope, 2003 ; Walters, Bennett, & Noto, 2000). There are several theories that try to use social norms to explain alcohol use among college students. For instance, theory of normative social behavior of Rimal, Lapinski, Cook, and Real (2005) explained that percieved norms consist of descriptive norms and injunctive norms. Descriptive norms are an individual's beliefs in prevelence of behaviors (what is normal). Injuctive norms are an individual's perception of other people's expectation towards one's self. If an individual do not meet the expectation, how he/she will be social sanctioned (what ought to be done). In this case, if a student believes that friends see alcohol drinking as a normal activity, he/she has to drink alcohol in order to maintain friendship or earn friends' acceptance. Rimal and Real believe that descriptive norms are similar to normative norms while injuctive norms are alike subjective norms according to Ajzen's theory of planned behavior (Real & Rimal, 2007; Rimal et al., 2005).

The mechanism between descriptive norms and behaviors is intervened by injunctive norms, outcome expectation, and group identity. Firstly, injunctive norms may not relate to descriptive norms. An individual may see alcohol drinking as a normal behavior. But if an individual also finds that friends will not blame him/her for not drinking alcohol or other people will blame him/her for drinking alcohol, the individual may not drink alcohol coresponding to descriptive norm. It can be said that

descriptive norms affects behavior by having injunctive norms as a moderator. Secondly, outcome expectation is the expectation of the consequences from alcohol use such as it is accepted by an individual as well as other people so it is common to drink. Lastly, group identity is a personal need to have other people as a role model so that an individual can imitate and become similar to a other people in a group. This mechanism can be illustrated in Figure 2.1.

In order to use this mechanism to create an intervention, it can be based on its belief that the change of social norm's perception about alcohol drinking can change alcohol use behavior. For example, educating students about alcohol use prevalence in university and what others think about alcohol drink and using normative feedback. One of the interventions adopting this approach is brief intervention.

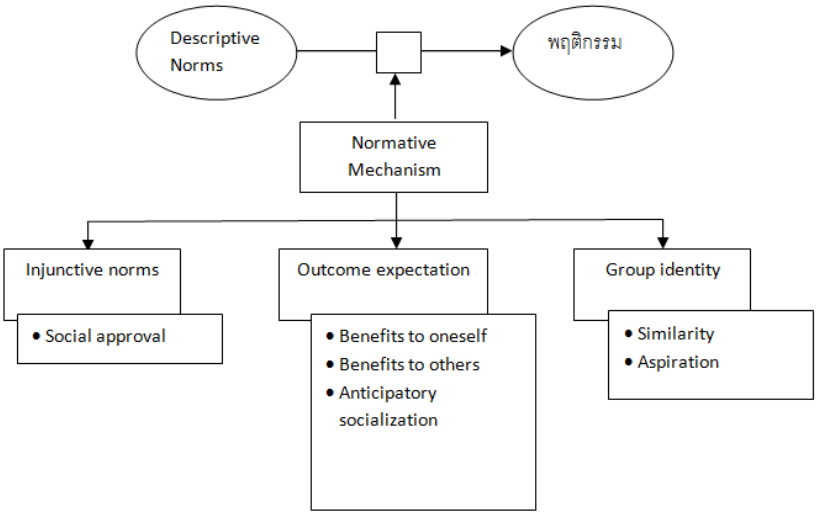

Figure 2.1 Cognitive mechanisms between descriptive norms and injunctive norms on behaviors, adapted from Rimal et al. (2005).

However, from research integration of Borsari and Carey (2001), they found that the relaionship between social norms and alcohol use among college students was not correlated. Firstly, Rimal et al. (2005) explained that the reason might be an inadequate underdstanding in cognitive mechanism between norms and drinking behavior. Secondly, from compensatory model's point of view, alcohol use is a result from various factors such as personal factors, environmental factors, and sociocultural

factors. Despite of the same environment and apart from sociocultural factors, individual differences can diverge an influence from environment on each individual. Therefore, developmental theory and social normative theory may be insufficient to understand alcohol use problem among college students why an individual has an uneven risk to adopt a group's value even is in the same circumstance.

2.2.3 Personality and alcohol useamong college student

Personality is one of personal factors which is commonly used in order to study individual's behaviors. Alcohol use in students also uses personalty to examine whether or not it affects student's alcohol consumption. There is a great number of studies which found that certain characteristics of personality relate to alcohol use in youth and college student. Carlson, Johnson, and Jacobs (2010) found that Impulsiveness, Thrill and Adventure Seeking, and Boredom Susceptibility were associated with binge drinking. Moreover, Shin, Hong, and Jeon (2012) found that Urgency and Sensation Seeking were related to drinking and problems from alcohol use. In Thailand, Sakulsriprasert (2008) found that undergraduate students who had risky alcohol drinking behavior liked excitement and new experience and were self-indulgent and irresponsible.

In conclusion, an important conceptual framework in the study on the relationship between personality and alcohol use among college students is trait theory according to five factor model and Impulsive-related trait. This theory explains that the causes of personality is biological function or biological based personality. Nevertheless, there are several arguments against this theory. Firstly, it focuses only on physiology and overlooks childhood development which can affect personality and adjustment. Previous studies found that upbringing and childhood experiences influence alcohol useand substance use behavior. For instance, Vungkhanching, Sher, Jackson, and Parra (2004) found that a caretaker who addicted to alcohol had an effecton an individual's attachment and led to alcohol drinking when an individual grows up. Piko and Balázs (2012) also found that an individual whom was raised in Authoritative parenting style had lower frequency and quantity of alcohol drinking than an individual received other types of parenting styles. The study of Kassel, Wardle, and Roberts (2007) found that an individual with unstable attachment had

higher alcohol use. Additionally, an individual with childhood abusive experiences tended to have mental health problems and use drugs more (Wright, Crawford, & Del Castillo, 2009) Secondly, biological-based personality misses an importance of various contexts and circumstances. It generalizely explains personality in a big picture, but does not give an appropriate explanation of diverse individual differnces in various situations. This can affect the application of this theory to understand an individual in practice (Hergenhahn & Olson, 2007).

From these aguement from the literature review, schema theory can explain the construction of an individual's personality beter than other theories. It also pays attention to environment as a factor that relates to personal attribution. Therefore, an understanding in alcohol use among college students is valuable to create an appropriate intervention for students who have different kinds of risks. The details of schema theory will be described below.

2.3 Schema theory

The authors will provide the detail of schema theory in 3 parts. The first part is the history basis of schema theory. The following part is main theoretical concept of schema theory. And, the last part is the using schema theory to conceptualize alcohol use among college students

2.3.1 The history basis of schema theory.

Developed by Young, Klosko, and Weishaar (2003), schema theory is an integrative theory that significantly expands on Beck's cognitive-behavioral approach by combining theory and techniques from Gestalt, attachment, object relations, constructivist, and psychodynamic approaches. The author reviewed the history root of schema theory and presented in two phase: the development of Beck's cognitive-behavioral approach and the expansion to schema theory.

2.3.1.1 The development of Beck's cognitive-behavioral approach.

"Schema" is a word utilized in many fields of study and has long historical root. In Hellenistic period, Stoic philosophers proposed logical

principle called “inference schemata.” Immanuel Kant, a German philosopher, referred schema to the logical functions of judgment that categorized members to a class. Diverse fields of philosophy, geometry, mathematics, education, and computer programming also uses the term of a “schema” (Robertson, 2010; Seligman, 2006; Young et al., 2003).

In cognitive psychology field, the term “schema” especially has extensive historical root. Cognitive psychologists define schema as cognitive pattern imposed on reality or experience to help individual to explain it, to mediate perception, and to guide their responses. The term “schema” is also defines as an abstract representation of the distinctive characteristics of an event (Robinson-Riegler & Robinson-Riegler, 2009). In particular, Jean Piaget, a Swiss psychologist used this term to describe child cognitive development. Piaget believed that cognitive development results from the interaction between innate schema and environment. When encountering a new situation, human beings are motivated to maintain a balance between preserving familiarity and seeking novelty. Assimilation is the process of putting a novel experience into existing schema. Accommodation, on the other hand, is the process of revising an existing schema to fit a new experience (Thimm, 2011; Young et al., 2003).

In the late 1950s to early 1960s, Arron Beck, an American psychiatrist, developed cognitive therapy (CT). At that time, Beck had previously been trained in psychoanalysis. He conducted research to test psychoanalytic explanation on depression. Psychoanalysis believed that depression was the result of introjection defense mechanism. Therefore, he examined the dream of depressed patients, which had hypothesized to apparent themes of hostility than non-clinical sample. Surprisingly, the dream of depressed sample had less themes of hostility, and had greater themes of defectiveness, loss and deprivation (Beck, 2011). He further noticed that these themes were consistent with the patients’ belief when they were awake. The findings from research led Beck to believe that psychoanalytic concept on depression might not valid. Additionally, when using a free-association technique with depressed patient, Beck found that all patients had expressed their negative thoughts which were relevant to depressive themes. Therefore, Beck began to develop the stress-diathesis model for depression, which believed that information-processing might constitute as

a vulnerability factor of depression. (Alford & Beck, 1997; J. S. Beck, 2011; Robertson, 2010)

In 1967, Beck introduced the concepts of schema, which is defined as complex cognitive structures that process stimuli (e.g., data screening, encoding and evaluating) provide meaning, and activate related psychobiological systems. Schema has been developed from the early age. He hypothesized that schema distorts information processing which can result in cognitive bias, inappropriate affect, and maladaptive behaviors (Alford & Beck, 1997; Thimm, 2011).

Due to some unresolved question emerging from several research and experiments (e.g., the fixation of attention, particularly in anxiety disorders), Beck then revised and expand his theory. He focused on automatic information-processing, which was identified in the sense of unconscious. And, he also interested in the meaning-maker cognition of individuals. In 1990, Beck developed the cognitive theory of personality. He pointed out that cognitive, affective, and motivational processes are determined by the idiosyncratic structures, or schema, that constitute the basic elements of personality (Alford & Beck, 1997). Therefore, personality structure is comprised of relatively stable organization of schemas, such as cognitive schema, affective schema, motivational and behavioral schema, and physiological schema (Alford & Beck, 1997). In addition to personality structure, schemas contain the specific content which can refer as core beliefs. Beck theorized that negative core beliefs essentially fall into two broad groups: core beliefs associated with helplessness, and core beliefs associated with unlovable (J. S. Beck, 2011). Beck's cognitive model is referred as generic cognitive model, where provides a theoretical framework for understand information-processing in several psychological disorders (Beck & Haigh, 2014). Subsequently, Young et al. (2003) extended the original cognitive model of Beck by proposing schema theory.

2.3.1.2 The expansion from Beck's cognitive model to Young's schema theory

In the early 1980, after finishing his postdoctoral training in Beck's cognitive therapy, Jeffrey Young was working as a clinical director at the Center for Cognitive Therapy. Young had developed his particular interest on difficult patients who did not respond to short-term treatment (Edwards & Arntz, 2012). Young

recognized that there were two aspects that therapist encountered with difficult patients: therapeutic relationship and affect regulation.

For therapeutic relationship, Beck defined patient-therapist relationship in CT as collaborative relationship, which therapist expresses empathic understanding to patients. In addition, therapists encourage patients to identify treatment goal and work on them together. It has been found that may patients who sought treatment can respond quickly to this collaborative relationship. However, Young found that some difficult patients were hostile, passive, helpless, withdrawn, or unmotivated. Thus, these patients could not engage in a collaborative relationship with the therapist within a few sessions. Difficulty in the therapeutic relationship mirrored their difficulties in relating to other people outside therapy. Young reviewed other therapeutic approaches that focused on interpersonal relationship, especially attachment theory. According to John Bowlby, one of the pioneers of attachment theory, human beings have an attachment instinct that aims at establishing a stable relationship with the mother. The attachment with the mother develops individual's internal working models which are to prototype of relationship between them and others. Although internal working models are psychodynamic, it conceptualized in a cognitive concept. Young drew on metaphors form information processing and described how individuals develop working model representing principal features of the relationship and guided interpersonal behaviors (Edwards & Arntz, 2012). The disturbed or dysfunction relationship with mothers or the primary care takers would be the source of severe difficulties in interpersonal relationship, especially intimacy partners (Daniel, 2006; Edwards & Arntz, 2012). Patients are likely to impose rigid working models on relationship into interaction with the therapist. Young integrated the notion of theory and utilized in his therapeutic model such as empahtic confrontation and limited reparenting.

For affect regulation, it was found that difficult patients would have problems with affect regulation; for instance, overly emotional restriction, inadequate self-control, hostility. The affect regulation problem make the traditional cognitive therapy techniques, such as rational analysis, changing negative thoughts, and experimenting the new behaviors, failed to achieve change at the emotional level (Edwards & Arntz, 2012). The affect regulation problem also makes patients unable

to observe and record their thoughts and feeling effectively since many of these patients habitually engage in cognitive and affective avoidance. The thoughts and feelings that would be blocked to reduce negative affect associated with childhood memories. It was also found that early childhood emotional experiences were uneasily accessible to verbal introspection (Edwards & Arntz, 2012; Young et al., 2003). Although Beck pointed out that images and fantasies could reveal the materials of this emotional level, there were several other approaches that had already have a rich literature on imagery techniques. In 1984, Young consulted a gestalt therapist, and was impressed by experiential techniques. He decided to incorporate these methods into cognitive therapy. In the same year, Young present a seminar handout entitle *"Cognitive Therapy for Personality Disorders and Difficult Patients"* (Edwards & Arntz, 2012).

In 1990, Young initially called an adaptive version of cognitive therapy for difficult patients as schema-focused therapy. Young published the book entitled *"Cognitive Therapy for Personality Disorders: A Schema-Focused Approach"* in 1994. In the beginning, the main focus of schema therapy was the difficulties presented by particular kinds of challenging cases. Later, researcher and practitioners stated to address specific disorder such as bipolar disorder, depression, eating disorders as well as substance use disorders.

Schema therapy had achieved a distinct identity by the end of the 1990s. The case conceptualization was based on an understanding of patients, early maladaptive schemas, dysfunctional coping style, and schema modes, which affect the patients' current life in work, leisure, and relationship (Edwards & Arntz, 2012; McGuire, 2000). All of these are the main concepts of schema therapy that the author would elaborate in next session.

2.3.2 Main concepts of schema theory

Three main theoretical concepts of schema theory consist of early maladaptive schemas, coping styles, and schema modes. The details of each constructs are presented below.

2.3.2.1 Early maladaptive schema

According to Young et al. (2003), early maladaptive schema (EMSs) are characterized by a broad, pervasive pattern consisting of memories, emotions, cognitions, and bodily sensation, which determine the relationships of oneself with other. Young et al. (2003) hypothesized that EMS is developed during childhood or adolescence, and then elaborated throughout one's lifetime. EMS is dysfunctional to a significant degree.

Schemas function as filters through which individuals perceive, interpret, and predict the world. Schema helps individuals to understand themselves, others, and events surrounding them. People with characterological problems, however, developed maladaptive schemas at early ages and engage in self-defeating life patterns. Although these life patterns cause them suffering, it is comfortable and familiar to keep their life going. Through cognitive bias, they tend to misperceive situations and distort their thought in such a manner that confirms the EMS and denying information that contradicts the EMS. These repeated self-defeating life patterns lead them to mental health problems.

Young et al. (2003) pointed out that EMS is reality-based representations of individual's early environment. And the dysfunctional nature of EMSs apparently persists in later life. Young theorized that maladaptive behaviors of individual are not part of EMS, but such behaviors are driven by EMS. In other words, when an EMS of individuals is triggered by the situation which is similar to traumatic experience of their childhood, they are overwhelmed by a strong negative emotion such as shame, depress, grief, or fear. The individual will respond to these negative emotions in some manners, healthy or maladaptive.

2.3.2.1.1 The origin of early maladaptive schemas

EMSs are the results of the interaction between early environment and child's temperament (Van Genderen, Rijkeboer, & Arntz, 2012; Young et al., 2003).

Early environment. According to Young et al. (2003), positive early environment is the environment that provide basic core emotional needs for children. The core emotional needs are comprised of (1) secure attachments to other, (2) autonomy, competence and sense of identity, (3) Freedom to

express valid needs and emotions, (4) spontaneity and play, and (5) realistic limits and control. The healthy and adaptive individual is one who can meet these core emotional needs.

In the other hand, toxic childhood environments that foster the acquisition of EMSs consist of toxic frustration of needs, traumatization or victimization, experiences with too much of a good things, and selective internalization.

Toxic childhood environments are usually influenced by parents. EMSs may be endangered by other influences such as peers, school, community groups, or the surrounding culture. Nevertheless, EMSs which are developed in later life generally are less powerful and pervasive.

Emotional temperament. The child's emotional temperament is an innate aspect, which make each child has a unique and distinct personality. Emotional temperament interacts with toxic childhood environment. Different emotional temperament makes each child expose different life circumstances. For illustration, an aggressive child tends to elicit physical abuse from a violent parent than a shy and passive child. Young et al. (2003) believed that extreme early environment can dominate over emotional temperament. Love and caring parents, for instance, can encourage a withdrawal child to be sociable and friendly. In the other hand, extreme temperament may override an ordinary environment.

2.3.2.1.2 Early maladaptive schemas and schema domain

In Young et al. (2003)'s theoretical model, there are 18 EMSs, which can be categorized into 5 domains.

Domain I: Disconnection and Rejection

Individuals with EMSs in this domain are unable to develop secure and satisfying relationship with others. They believe that their needs for stable, secure relationship, love and belonging will not be met. This domain consists of 5 EMSs.

- *Abandonment.* People with this EMS perceive that their significant others will not be able to continue providing emotional support,

and protection due to their emotional instability and unreliability. Or, because they will abandon the individual in favor of someone better.

- *Mistrust.* People with this EMS expect that others will hurt, abuse, humiliate, cheat, lie, manipulate, or take advantage.
- *Emotional Deprivation.* People with this EMS expect that their desire for emotional support will not adequately provided by others.
- *Defectiveness.* People with this EMS tend to feel that they are defective, bad, unwanted, inferior, or invalid in important respects or that one would be unlovable to significant others if exposed.
- *Social Isolation.* People with this EMS always feel that they are isolated alienate form others.

Domain II: Impaired Autonomy and Performance

Individuals with schemas in this domain believe that they are inability to differentiate themselves from parents and to do activities in daily life independently. Typically, they have been raised by overprotect parents. In addition, their parents might fail to reinforce them when performing something competently. There are 4 EMSs in this domain.

- *Dependence.* People with this EMS believe that, without helping form others, they are incompetent to handle everyday life responsibilities. They also often express themselves in helpless manner.
- *Vulnerability to Harm and Illness.* People with this EMS tend to exaggerate their fears; for instance, imminent catastrophe will strike at any time and that one will be unable to prevent it.
- *Enmeshment.* People with this EMS usually have excessive emotional involvement with one or more significant others. This over involvement obstructs the individuation process or normal social development. The people often believe that the enmeshed individual(s) could not function or be happy without the others.
- *Failure.* People with this EMS believe that they will inevitably fail, or is fundamentally inadequate relative to their peers in areas of achievement.

Domain III: Impaired Limits

Individuals with EMSs in this domain have not adequate internal limits relating to self-discipline or reciprocity. They have difficulty respecting the rights of others, cooperating with others, making commitments, or setting and meeting realistic personal goals. This domain includes 2 EMSs.

- *Entitlement.* People with this EMSs believe that they are superior to others, and entitled to special rights and privileges. They feel that they can do everything they want and insist not to obedient they rule or social norms.
- *Insufficient Self-Control.* People with this EMS have difficulty controlling themselves and have low frustration tolerance. These people are not able to regulate their emotional expression and impulses.

Domain IV: Other Directedness

Individuals with EMSs in this domain focus on the needs of other than their own needs in order to gain approval and emotional connection. They are rarely aware of their feelings and preferences. This domain is generally the results of conditional acceptance from their parents. As children, they must constrain their important for obtaining love and approval. This domain comprises Subjugation, Self Sacrifice, and Social Approval.

- *Subjugation.* People with this EMS surrender of control to others, and suppress their desires or feelings in order to avoid anger, retaliation or abandonment.
- *Self Sacrifice.* People with this EMS excessively concentrate on the needs of others at the expense of their own gratification. This is because they are too sensitive to others' suffering.
- *Social Approval.* People with this EMS have excessive need of approval and recognition from others.

Domain V: Overvigialance and Inhibition

Individuals with this domain suppress their spontaneous feeling and action in order to meet their rigid, internal rules and expectation about performances, standards and successes. The family of origin generally is demanding, punitive, perfectionism, which teach the individual to avoid mistakes, focus on successes predominate over pleasure, joy, and relaxation.

- *Negativity*. People with this EMS tend to concentrate on negative aspects of life (e.g., death, loss, pain, unresolved problems, betrayal, mistakes), whereas the positive aspects of life are minimized or neglected.
- *Emotional Inhibition.* People with this EMS constrain and inhibit their spontaneous actions and feeling in order to avoid disproval by others or losing control of their impulses.
- *Unrelenting Standards.* People with this EMS strive to meet high standards of performance in order to avoid criticism. Generally, this EMS is presented as perfectionism, having rigid rules, and preoccupation with time and efficiency.
- *Punitiveness.* People with this EMS hold the strong belief that people making mistakes should be harshly punished. They have difficulty forgiving other people who are committed mistakes.

2.3.2.1.3 Theoretical relationship between EMS and alcohol use.

Based on clinical experiences, Young and Ball have employed schema theory for conceptualizing substance use disorder.

Although Young et al. (2003) did not provide much information about the relationship between alcohol use and EMSs. However, he hypothesized that individuals drink alcohol or take drugs in order to avoid negative feelings that is triggered by the situation similar to early toxic environment. He further stated that addictive behaviors often accompany Insufficient Self-Control. It is because people with less self-control tend to use substance in order to seek pleasure and avoid discomfort.

Ball (1998, 2012) elaborated the relationship between substance use and EMSs. He proposed that EMSs are a risk factor leading to develop, perpetuate, and relapse of substance abuse and dependence. People with an EMS are sensitive to be triggered by several situations, such as interpersonal conflict, social pressures, and negative emotional state. Individuals with high Social Approval, for example, are more sensitive to social pressure to use drugs than others without this EMS.

2.3.2.2 Coping styles and coping responses

Coping styles and responses are developed in order to adapt to EMSs. When the EMS is triggered, individual usually experiences the intense and overwhelming emotions. Behavior, as mentioned above, is not part of the schema, but EMS drives behavior to cope with negative emotions. In other word, it is a part of coping styles. Therefore, coping styles are defined as the coping strategy that individual habitually adopts to cope with negative emotions. Young et al. (2003), then, pointed out that he differentiate EMSs from coping styles because people with the same EMS could utilize different coping styles in different situations. Coping styles can refer as a trait. Coping responses, in the other hand, is the specific behavior that the individual exhibit at a specific point of the time. Thus, coping responses can refer as a state. The detail of coping styles and coping responses are presented below.

2.3.2.2.1 Maladaptive coping styles

An EMS represents the existing of threat which is the frustration of child's core emotional need(s) in the childhood environment. The child inevitably utilized one or more coping styles to cope with the threat. These coping styles are generally considered as adaptive in childhood and can be viewed as healthy survival mechanisms. However, these coping styles become maladaptive when the individual get older due to the fact that they perpetuate the EMS. Despite, in the short term these coping styles usually provide some relief, in the long run they lead to difficulties in fundamental areas of life. Generally, people perform coping style without conscious (Van Genderen, 2012). Young et al. (2003) developed the concept of coping styles from the basic responses of organisms on threat: fight, flight and freeze. Correspondingly, coping styles can divide into 3 component, overcompensation, avoidance, and surrender.

Schema surrender. When utilizing this coping style, individuals accept that EMS is true, and act in way confirming the EMS. Mostly, they do not realize that what they are doing repeat their EMSs (Briere, 2002; Daniel, 2006). For example, individuals with Emotional Deprivation select a partner who is emotionally deprived, and does not provide them to meet needs.

Schema avoidance. When utilizing this coping style, individuals try to avoid activities or situation that may trigger their EMS. Also,

they avoid thinking about their EMS. When such images or thoughts come to their mind, they tend to block these thought out of their minds, or distract themselves such as drinking excessively, overeat, compulsively clean, seek stimulation, etc.

Schema overcompensation. When utilizing this coping style, individuals think, behave, or feel in the opposite way from their EMS. However, these are often inappropriate with the situation (e.g., overly assertive, aggressive). For illustration, individuals who felt their worthless as children try to be perfect as adults.

According to Young et al. (2003) The emotional temperament is hypothesized to be an important factor determining why individuals utilzing certain coping styles rather than others.

2.3.2.2.2 Coping Responses

Young et al. (2003) defined coping responses as the specific behaviors or strategies that the individual exhibit at a specific point of the time. When the individuals habitually adopt certain coping responses, avoid, surrender or overcompensate; these can be adhered into coping styles. For example, a man with abandonment broke up with his girlfriend. He went out to the pub and start drinking beer until he passed out. In this situation with his girlfriend, drinking beer is his avoidance coping response. Other avoidance coping responses he adopts could be driving fast and carelessly, gambling, shopping in order to distract negative feeling from rejection and abandonment. If he uses these avoidance coping responses several times, his coping styles would be avoidance.

2.3.2.2.3 Coping styles and alcohol use among college students

As mentioned earlier, Young et al. (2003) pointed out that alcohol consumption is one of avoidance coping responses. With the exception of Insufficient Self-Control, alcohol consumption can be considered as surrender as a coping response. Ball (1998, 2012) further explained that alcohol and substance use can be considered as surrender, avoidance, and overcompensation coping responses.

First, substance use can be considered as surrender coping styles when EMSs such as Entitlement, Insufficient Self-Control, Subjugation,

Self-Sacrifice, and Approval Seeking are triggered. For example, a man with Entitlement usually drinks alcohol to express his masculinity and to dominate over other men. For another example, a male student with Subjugation tends to comply with drinking norms of his peers in order to avoid anger and retaliation.

Second, substance use can be viewed as an overcompensate coping response. For example, a female student with Social Isolation desire to drink alcohol excessively to fit into groups.

Third, substance use can be considered as an avoidance coping response. According to Ball's clinical experiences, this type of coping responses is more potent triggering factor for substance use disorders. This type of coping responses is generally found with Abandonment, Mistrust, Emotional Deprivation, Defectiveness, Social Isolation, Dependence, Enmeshment, Failure, Emotional Inhibition, Unrelenting Standard, and Punitiveness.

As described above, alcohol use can be the part of all coping styles. Nevertheless, clinical experiences and research suggested that some patients are not respond well with standard schema model with coping styles; for instance, patients who excessively avoid or overcompensate to the underlying schemas, patient who rigidly self-punitive and self-critical, patients with severe personality disorders. Young et al. (2003), therefore, developed concept of schema mode to conceptualize and treat these patients. Currently, schema mode concept has been used with many of higher functional patients as well as people without severe mental illness (Farrell, Reiss, & Shaw, 2014; Young et al., 2003).

2.3.2.3 Schema modes

Schema modes are the moment-to-moment emotional states and coping responses, which could be adaptive or maladaptive, that are currently active for an individual. Schema modes are triggered by a situation that each individual is oversensitive at any given point in time. Thus, schema modes are the instantaneous, continuing changing, but predominant states of mind in the individual's current behaviors and moods (Van Genderen et al., 2012; Young et al., 2003). Young et al. (2003) used the term "flip" to refer to the mode switching.

2.3.2.3.1 Theoretical relationship between EMSs and schema modes

Young et al. (2003) and Van Genderen (2012) explained the relationship between EMS and schema modes in two aspects.

First, schema modes are operated when an EMS is activated. Not every moment their EMSs are activated. When activated, the EMS drives the individual to utilize coping responses or have any emotional states. These individual responds at any given situation can refer as schema modes (Van Genderen et al., 2012; Young et al., 2003). So, in the other words, behaviors and feeling are not part of EMSs, but they are the responses to schema activation. These responses could be referred as schema modes. It can be concluded that EMSs function schema content and schema modes function as schema processes.

Second, individuals with different EMSs use different schema modes. Young et al. (2003) stated that each individual utilizes certain schema modes. Similarly some Axis II diagnoses can be explained in terms of their typical schema modes. To illustration, the patient with borderline personality disorder often exhibits certain modes, namely Abandoned Child, Angry Child, Punitive Parent, and Detached Protector. The study of Lobbestael, Van Vreeswijk, and Arntz (2008) identified that patient with different personality disorders had unique schema mode profiles. They also pointed out that each person exhibited several characteristic schema modes, but some combinations appear typically for certain personality disorders.

The theoretical relationship between EMSs and schema modes is illustrated in Figure 2.2.

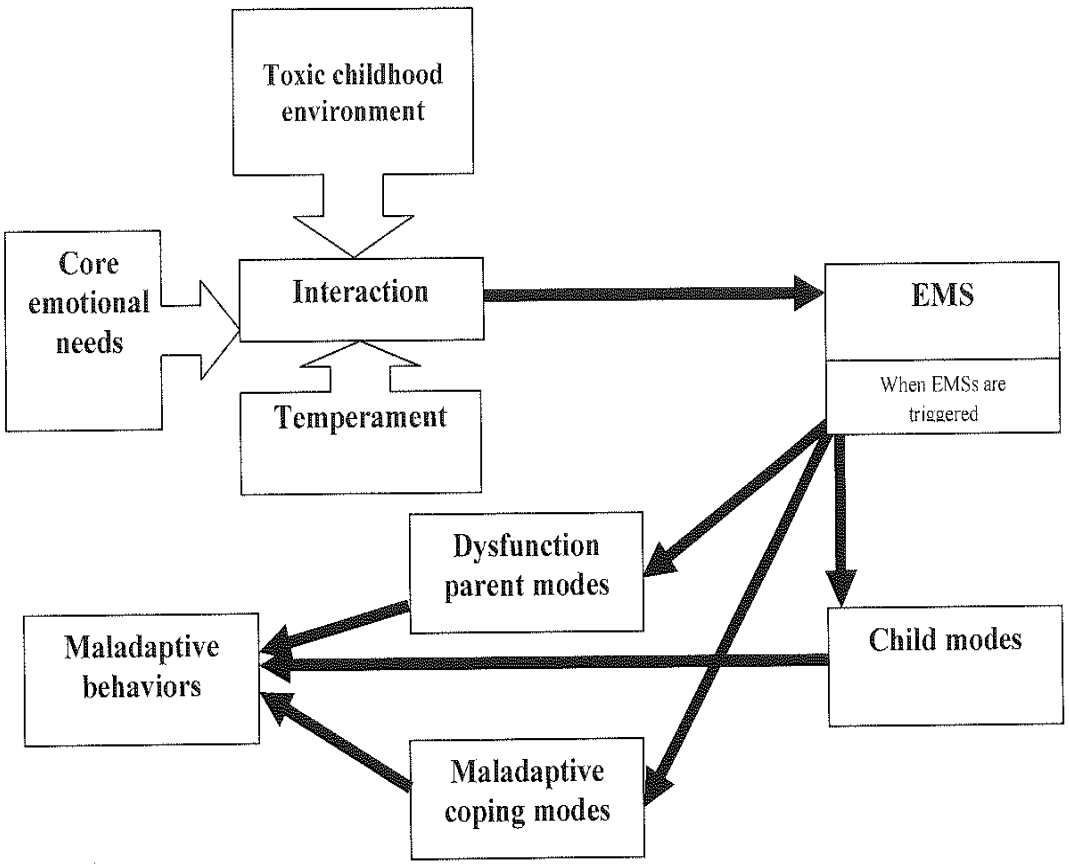

Figure 2.2 The theoretical relationship between EMSs and schema modes, adapted form Farrell et al. (2014)

The differences between EMSs and schema modes

There are two essential differences between EMSs and schema modes.

First, EMSs are stable, like trait construct, whereas schema modes change from moment-to-moment, like state construct. Young et al. (2003) developed schema modes from the concept of state-trait distinction. When individuals have an EMS, not every moment their EMSs are activated. The EMS likes a trait that may or may not be activated at a given moment. Thus the EMS tells us about the function of the patient over time, but it does not tell us about the patient's current state (Van Genderen et al., 2012; Young et al., 2003).

Second, EMSs reflect a one-dimensional theme, whereas schema modes reflect a broad concept which is a constellation of coping responses and emotional states, and cannot identify into one-theme. For example, the EMS of Defectiveness is defined as the belief that oneself is inferior, bad, unwanted, and unlovable. In contrary, the mode of Vulnerable Child is defined as the feelings of fear, sadness, and helpless that is active at that moment (Van Genderen et al., 2012; Young et al., 2003).

2.3.2.3.2 Type of schema modes

Young et al. (2003) identified 10 schema modes that could be categorized into 4 groups, including (1) Child Modes, (2) Maladaptive Coping Modes, (3) Dysfunctional Parent Modes, and (4) Healthy Adult Mode.

1) Child Modes

Child modes are innate and universal, which all children are born with the potential to manifest them. Four Child modes are identified.

- *Vulnerable Child.* People in this mode experiences frightened, sad, overwhelmed, or helpless. In regards to the core mode for the purposes of schema work, this mode associates with most of EMSs.
- *Angry Child.* People in this mode become angry when their core emotional needs are not being met. This mode commonly associates with Abandonment, Mistrust, Emotional Deprivation, and Subjugation.
- *Impulsive/Undisciplined Child.* People in this mode act impulsively to pursue pleasure and fill need regardless of limits or concern for others. Moreover, people with this mode may appear spoiled, careless, impatient, or out of control. The mode usually associates with Entitlement and Insufficient Self-Control.
- *Happy Child.* People in this mode feel loved and content due to their core emotional need are met. This mode is hypothesized that it is not related to any EMSs, and presents the healthy absence of EMS activation.

2) Maladaptive Coping Modes

Maladaptive Coping modes are the results of the child's attempts to adapt to living with unmet emotional needs. These modes used to be adaptive when the individual was a child. However, they become maladaptive when the individual get older. These modes correspond to the coping processes of surrender, avoidance, overcompensation.

- *Compliant Surrender.* People in this mode tend to be passive and dependent. They are obedient, allowing others to abuse or neglect them in order to avoid retaliation or conflict.
- *Detached Protector.* People in this mode adopt schema avoidance as a coping style. They detach from others and constrain their emotion for protecting themselves from being vulnerable. They also feel numb and empty. In the other hand, they may become excessive self-reliance, use substance for relieving emotional pains, and seek for sensation.
- *Over-compensator.* People in this mode act as though the opposite of the EMS were true. If they feel inferior, they try to impress others with their accomplishments or status. They blame other when feeling guilty.

2.2.3 Dysfunctional Parent modes

Dysfunctional Parent modes is developed from internalizations of parents in their early life. Individuals who utilize these modes usually treat themselves and others as the parents treated them when they were children. Two Dysfunctional Parent modes are commonly found.

- *Punitive Parents.* People in this mode angrily criticize, punish or restricts themselves or others for expressing needs or making mistakes. This mode often found with Punitiveness and Defectiveness.
- *Demanding Parents.* People in this mode identify their parents that put the pressure on themselves or others to achieve unrealistically high expectation. This mode always associates with Unrelenting Standards and Self-Sacrifice.

2.2.3.1 Healthy Adult Mode

Healthy Adult mode is the healthy part of individuals. When utilizing this mode, people have positive and neutralized thoughts and feelings about

themselves. Hence, healthier individuals use this mode more. In contrary, more severe personality or disorders use this mode less.

After identifying by Young et al. (2003), schema modes were further identified by other scholars and practitioners for practice and research reasons. Some of them have not yet validated (Van Genderen et al., 2012).

- *Enraged Child.* People in this mode feel enraged and lose control. They tend to lose their control and injure other or objects.
- *Self-Aggrandizer.* People in this mode believe that they are entitled to special rights. They always do everything they want without the consideration for others.
- *Bully and Attack.* People in this mode show aggression, intimidation, or threats towards others in order to prevent them from being controlled or hurt.
- *Angry Protector.* People in this mode use anger to feel safe or protect themselves against others.
- *Obsessive Over-Control.* People in this mode do something repetitively in order to keep everything in control.
- *Paranoid.* People in this mode protect themselves from threats by suspecting others and investigate others' hidden agendas.
- *Conning and Manipulating.* People in this mode cheat, lie or manipulate other for achieving a specific aim.
- *Predator.* People with this mode eliminate rivals, obstacle, enemies, or threats in a cold, ruthless, calculating way.
- *Attention Seeking.* People in this mode seek for approval and attention from others with exaggerated behaviors, erotomania, or grandiosity.

The details of each schema modes and their relationships with EMSs are summarized in Table 2.1.

Table 2.1. The details of each schema modes and their relationship with EMSs.

Modes	Description	Common associated EMSs
Child Modes		
Vulnerable Child	Experiences dysphoric or anxious affect, especially fear, sadness, and helplessness, when in touch with associated schemas.	Abandonment, Mistrust/Abuse, Emotional Deprivation, Defectiveness, Social Isolation, Dependence, Vulnerability to Harm of Illness, Enmeshment, Negativity/Pessimism
Angry Child	Expresses anger directly in response to perceived unmet core needs or unfair treatment related to core schemas.	Abandonment, Mistrust/Abuse, Emotional Deprivation และ Subjugation
Impulsive Child	Impulsively acts according to immediate desires for pleasure without regard to limits or others' needs or feelings.	Entitlement, Insufficient Self-Control/Self-Discipline
Happy Child	Feels loved, connected, content, satisfied	None. Absence of activated schemas.
Maladaptive Coping Modes		
Compliant Surrender	Adopts a coping style of compliance and dependence.	
Detached Protector	Adopts a coping style of emotional withdrawal, disconnection, isolation, and behavioral avoidance.	
Overcompensator	Adopts a coping style of counter and control. May overcompensate through semi-adaptive means such as workaholism.	
Dysfunctional parent modes		
Punitive Parent	Restrict, criticizes, or punishes the self of others.	Subjugation, Punitiveness, Defectiveness, Mistrust/Abuse
Demanding Parent	Sets high expectations and high level of responsibility toward others; pressures the self or others to achieve them.	Unrelenting Standards, Self-Sacrifice
Healthy adults	Has positive and neutralized thoughts and feeling about himself/herself.	None. Absence of activated schemas.

Source: Adapted form Young (2003: 273-277)

In order to understand the relationship between early maladaptive schema and alcohol drinking problem, case conceptualization can be utilized. The case studies are college students who drink alcohol regularly. Case conceptualization in this study will be presented in 2 main sections; conceptualization of schema and coping style and conceptualization of schema and schema mode.

2.3.3.2 Case conceptualization model of EMS and coping style

Theoretically, the relationship between schema and alcohol use can be explained that alcohol use is one of the coping behaviors. Drinking alcohol is what an individual chooses to do when one's schema is activated by circumstance. There are 2 case studies that can be used to demonstrate conceptualization of schema and coping style: Manop and Aekkaphob.

Case study 1: Manop is a 21-year-old, third-year student in Humanities and Social Sciences field at an university. He was born and raised in a middle class and quite wealthy family. His father is an engineer and his mother is an accountant. They are both successful and busy with works that they have not spent much time taking care of Manop. As he is an only child and his family is affluent, he has been indulged. If he wants anything affordable, his parents will provide it to him. They said they felt guilty since they have not spent adequate time with him so they did not want to offend him. In addition, his parents are not disciplinarily strict with him because they often went home late so they did not have time to regulate Manop. Also, as his family infrequently spends time together, they prefer not to argue or cause any conflict. Manop has leadership attribution and is accepted among friends. He is a risk taker who can quickly think and make a decision. He is sometimes seen impatient, easily irritated, and careless. He is a self-indulgent who dislikes to be forced or be submissive. In his disfavored class, he is usually inattentive, skips the class, or sometimes sleeps in the class. His study performance is average.

Manop drinks alcohol 2-3 times per week. He normally goes out with male friends. He likes to invite friends to drink when he is bored or when he is doing an assignment at a dormitory. In his opinion, it is fun to drink with friends as they can have a discussion as well as drain some negative feelings. For example, Manop was angry with a professor who blamed and forced him to attend the class and dress appropriately like other students. Manop was very irritated being shamed in

front of classmates. That night, he could not handle with his anger, so he asked friends to drink. Manop said drinking with friends could help him release his anger and irritation toward the professor and also the shame toward his classmates. Manop also proudly added that he is highly alcohol-tolerant that he can drink a lot than anyone in his group.

From the historical background, the case conceptualization of Manop can be illustrated in Figure 2.3.

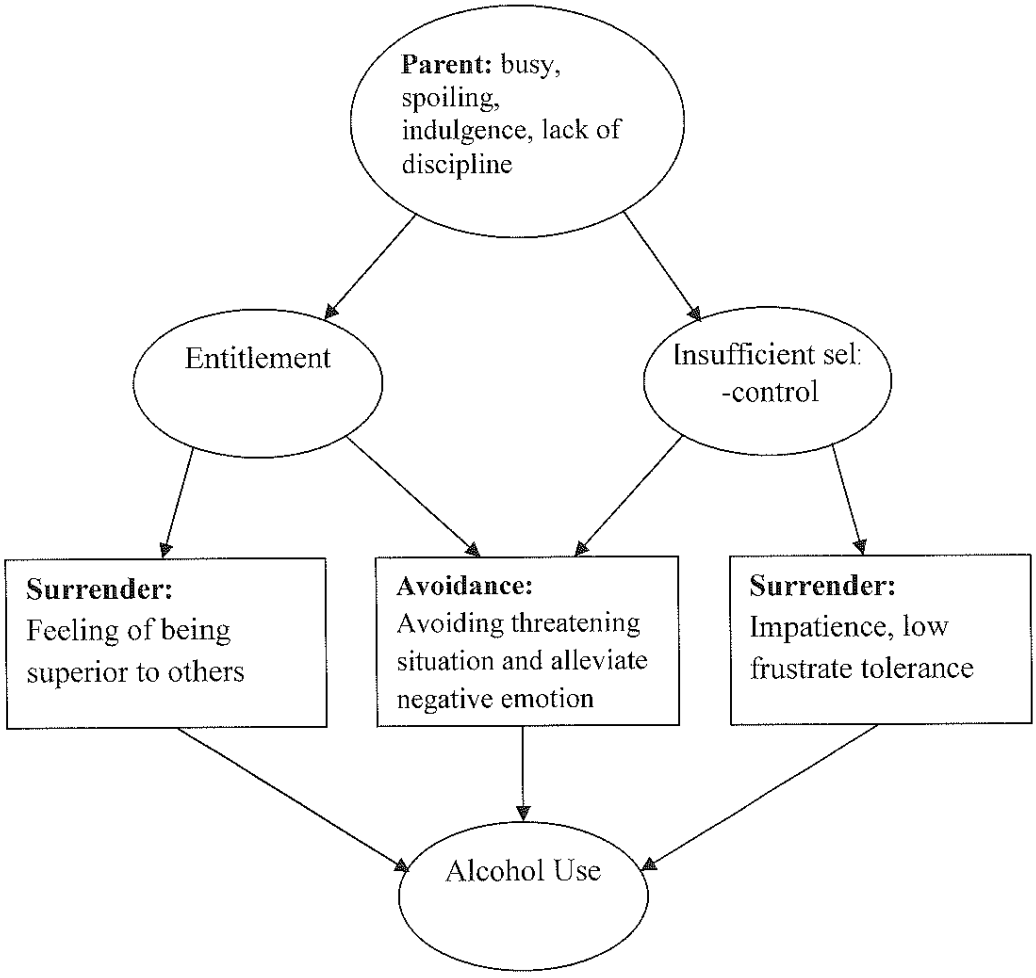

Figure 2.3 The theoretical relationship between EMSs and schema modes, adapted form Farrell et al. (2014)

From his background, Manop was born in quite affluent, spoiling, and lack-of-discipline family. His background and his characteristics indicate that Manop's schema is Entitlement and Insufficient Self-Control. However, his schema is not very extreme that can cause maladjustment like a patient. His schema exhibits in his personality; impatient, easily enraged, and easily frustrated. He likes to be superior and to be praised by others. His alcohol drinking behavior occurs when his schema is triggered. And the coping styles he chooses to respond to the trigger is expressing his masculinity or his superiority. This coping style complies with his Entitlement schema. It supports the idea that he is superior to other people. It also conforms with Insufficient self-control that he cannot properly handle frustration or boredom. Furthermore, he uses Avoidant coping style in order to decrease negative feelings. For instance, when he was obligated by the professor to follow the rules like other students (triggering Insufficient Self-Control schema) in front of classmates (triggering Entitlement schema).

Case Study 2: Aekkaphob is a second-year student in Medical school. When he was young, his family was wealthy. His father was a well-known businessman. However, when he was 7 years old, the business went bankrupt. His life totally changed. His father became very stressed out and started drinking alcohol heavily. He usually got drunk when coming back home. Although he is generally a quiet and private person, when he is drunk, he brawls at his mother. Sometimes he can be more violent as he beats Aekkaphob and his mother up. When he was young, Aekkaphob has seen his mother constantly secretly cried. He wished he could protect her. But he can only soothe her. His mother started to bake bakery for making money for the family. He also started helping her out. He helped her with baking and taking care of his 5-year-old sister such as washing her clothes and cooking for her. He has also done housekeeping chores because his mother was busy with work that she did not have time to look after him and his sister and his father was always drunk that he could not be productive. Aekkaphob said since his first memory, he had to work and take care of his sister that he was not able to play or have fun like other children. He, however, is loveable among friends as he likes to help anyone. When he sees people in suffering or discomfort, he has sympathy for them. If he does not help them one way or another, he will feel guilty and uneasy.

Aekkaphob drinks alcohol often. He drinks with friends or by himself. He admitted that after finish working at late night, he often feels lonely and isolated. Therefore, he tries to forget these feelings by drinking alcohol alone. He drinks with a group of friends when his friends ask him to do so and he does not want to decline. He thinks the friends of his may have negative feelings such as worried or lonely similarly to him. Once, a night before an examination while he was studying, his friend gave him a call and asked him to drink as the friend just broke up with a girlfriend. Aekkaphob unhesitatedly went out as he believed that a friend in need is a friend indeed.

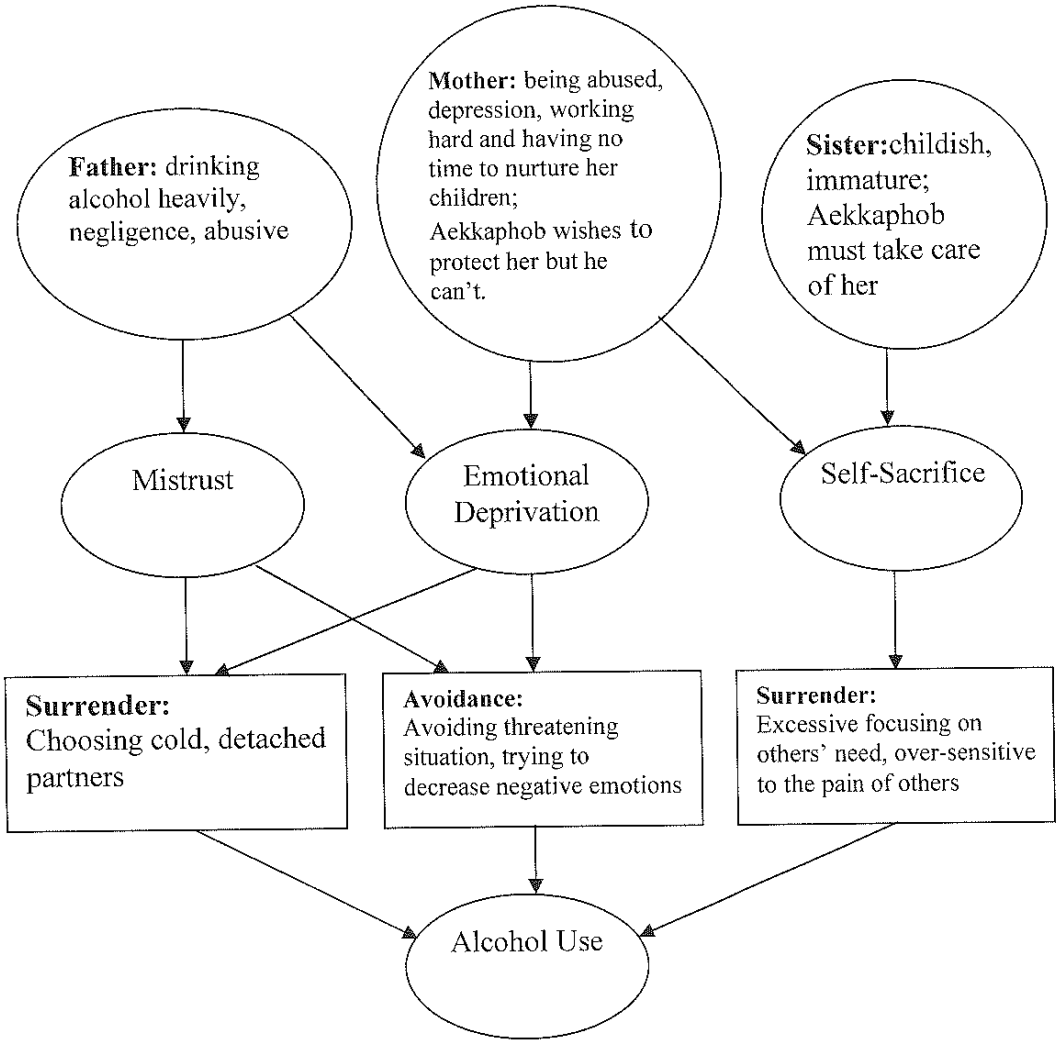

Figure 2.4 Case conceptualization of Aekkaphob, using model EMS and coping style

Aekkaphob had a girlfriend who studied in the same faculty and same class. He did not see her often because their sections are different. He also has to work after school and a girlfriend works at a faculty's union too. When he was in the second year in midterm of the first semester, a girlfriend broke up with him. Aekkaphob started drinking heavily. His grade went down and he skipped classes more often. The breakup reminded him of his childhood that he was abandoned and betrayed by his beloved and entrusted persons. He felt empty as if no one understood him and cared for him. From the historical background, the case conceptualization of Aekkaphob can be illustrated in Figure 2.4.

From his background, he was raised in a family affected by economic crisis so that his parents could not take good care of him. His father was alcoholic and abusive both physically and verbally. His mother was a victim of the violence. She also had a part time job so she did not have time for Aekkaphob. The abuse and lack of proper care caused his emotional needs unfulfilled. They also created Mistrust and Emotional Deprivation schema. Additionally, as he had a responsibility to support his mother emotionally and look after his sister, he has developed Self-Sacrifice schema. These 3 schemas reflect his caring and helpful personality while he does not want anything in return and isolates himself from others. His alcohol drinking behavior can occur in various situations when his schemas are aroused. For example, when his Emotional Deprivation schema which activate his emptiness that no one can fulfill, he tend to drink for reducing the negative emotions. When his Self-Sacrifice is aroused, he tends to sacrifice himself. If not, he will feel guilty and worried. He also tries to be a good friend to fit to his ideal image of friend. In case of alcohol drinking, he also tends to devote himself to his friends and never declines when friends ask him to drink. The breakup triggered his Mistrust and Emotional Deprivation schemas. He believes that his beloved will hurt him, betray him, and cannot complete his deep feelings. Hence, he drinks more heavily and it affects his life.

From the cases of Manop and Aekkaphob, they illustrated the relationship between schema, coping style, and alcohol use of college students. Theoretically, schema is a characteristic found in every person. The only differences are its severity and dimension. An individual with severe schema or several

inappropriate dimensions of maladaptive schemas, it will be easier to be triggered in more various situations. Also, the consequences in senses of emotions, thoughts, and behavior will be more intense.

In addition, there is another case conceptualization model have been used: the case conceptualization of EMS and schema mode. The details of this model are described as below.

2.3.3.3 Case conceptualization model of EMS and schema mode

The schema theory believes that EMS is constant and stable similarly to trait. Schema mode is, however, emotional states and coping responses individuals employ in order to cope when schema is activated. It can change from time to time so it is comparable to state. The two cases of Manop and Aekkaphob above can also be employed this model to conceptualize the relationship between schema and schema mode.

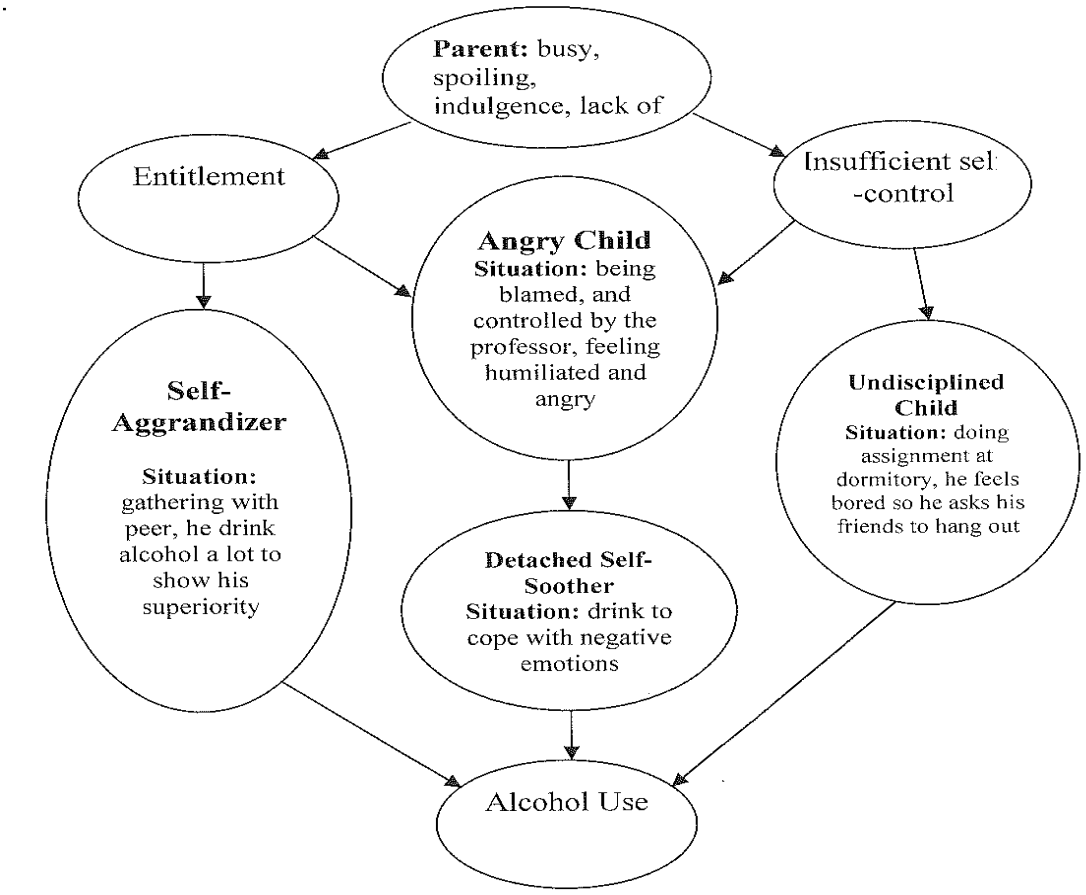

Figure 2.5 Case conceptualization of Manop, using model EMS and schema mode

Case study 1: Manop

According to historical background provided previously, the case conceptualization of Manop using EMS and schema mode model can be illustrated in Figure 2.5

The conceptualization model of EMS and schema mode is different from the model of EMS and coping style. Schema mode is developed by the concept of trait-state distinction. Schema mode is a state while schema is a trait. The conceptualization model of schema and schema mode of Manop can explain his drinking behavior. An emotionally sensitive situation will stimulate his schema. As a result, he will have some emotional states and use some coping responses to react to the situations. For instance, when the professor complained about him, his Entitlement and Insufficient Self-Control are activated. The complaint threatened his Entitlement or the belief that he is superior and more important than others. It intimidated when he thinks he is always right and should not be blamed. He thinks he does not have to behave like common people. It also threatened his Entitlement as he was compelled to dress accordingly to the rules and attend the class. He felt that his right was deprived. He could not endure these negativities. It made him angry and enraged with the professor. (Angry Child). He could not handle his anger, so he decided to drink alcohol to appease his feelings (Detached Self-Soother).

Other situations can affect his EMS that causes him to use schema mode. For example, in a group of friends, when he feels he is insignificant or inferior, he will use Self-Aggrandizer schema mode. He will try to surpass his friends such as drinking an excessive amount of alcohol drinks to show off his muscularity. He might be aggressive or threatening other people as well as devalue others. Moreover, in an boring situation such as working on a report, he inclines not to control himself to carry out the task until it finishes. He often evades working and does something more enjoyable and preferable like drinking alcohol and give himself an excuse such as “I can do it tomorrow,” or “I still have more time to do it later,” (Undisciplined Child schema mode).

Case Study 2: Aekkaphob.

According to historical background provided previously, the case conceptualization of Aekkaphob using EMS and schema mode model can be illustrated in Figure 2.6

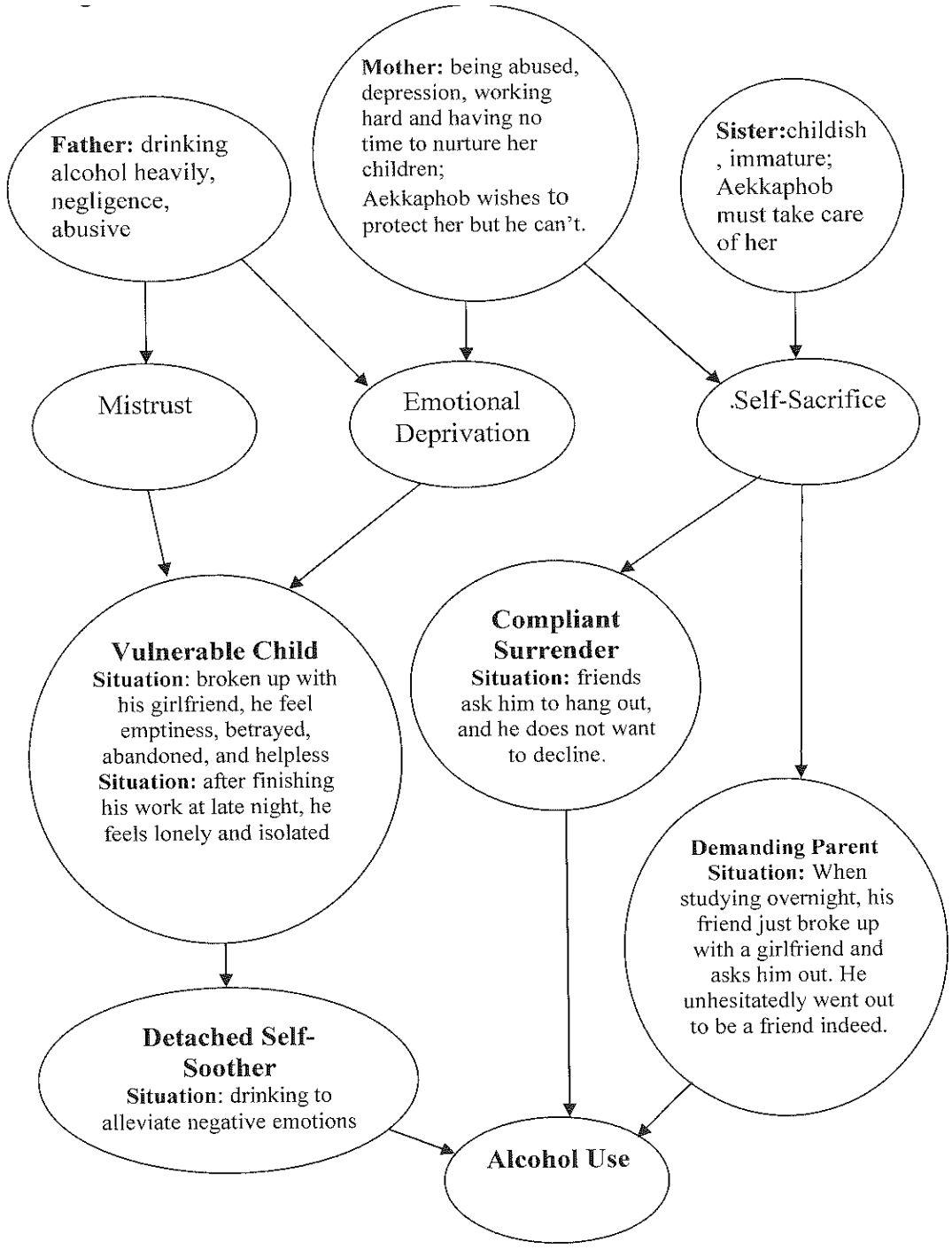

Figure 2.6 Case conceptualization of Aekkaphob, using model EMS and schema mode

Aekkaphob's EMSs are Mistrust and Emotional Deprivation as a result from his childhood environment. His father regularly drank alcohol and abused Aekkaphob and his mother. He felt helpless for himself and for his mother. His father only drank alcohol so that his mother had to work hard for the family. Aekkaphob also had to look after his sister as well as emotionally support his mother. Therefore, he developed Self-Sacrifice. This EMS reflects how he perceives the world and interprets what he experiences. The EMS can be triggered by sensitive situations. For instance, when he broke up with a girlfriend, both Mistrust and Emotional deprivation schemas were triggered at the same time. He felt that he was betrayed, hurt, sad, helpless, and isolated. These emotional states indicate Vulnerable Child schema mode. Additionally, the situation like going back to a dorm where he lives by himself after working can trigger Emotional Deprivation schema that leads to loneliness and sadness reflecting his Vulnerable Child mode. Aekkaphob decides to drink alcohol for avoiding those negative feelings (Detached Self Soother), but it is less severe than when he broke up. In a situation that his friends ask him to help or invite him to drink, his Self-Sacrifice is triggered. Generally, he complies with his friends' request because he thinks that the friends must feel lonely or worried like him (Compliant Surrender). When his friend asked him out to drink as he just broke up with a girlfriend on the night before an examination, he decided to go. Although the examination was important, he set high standard in relationship and friendship. He feels that he must make every effort to support friends who encounter problems (Demanding Parent schema mode).

As described above, conceptualization of alcohol use can be carried out by EMS and coping style model as well as EMS and schema mode model. Since there are no studies pointing out which model is better, practically, we can conceptualize by either model or both of them (Van Genderen, 2012). In this study, hence, the conceptualization is put into practice using EMS and schema mode model because this model is developed from the approach of trait-state distinction, which will be explained later.

2.3.4 Comparison between schema theory and other theories

In the development of schema theory, Young adopts a philosophy and concept from many approaches, especially Beck's cognitive behavioral model and psychodynamic approach, and then integrates into a structured, systematic model. Although overlapping with many other theories, schema theory differs from others in several aspects. The brief comparisons of some key similarities and differences among schema theory, Beck's cognitive behavioral model, and psychodynamic theory would be discussed in this section.

2.3.4.1 Beck's cognitive-behavioral model

Not surprisingly, Beck's cognitive-behavioral model and Young's schema theory have many key elements of similarity. Both of theories emphasize on cognitive structures that are idiosyncratic and stable, which constitute the basic elements of personality (Alford & Beck, 1997; Young et al., 2003). Both of them also include cognition, motivation, emotion, genetic makeup, coping mechanisms, and cultural inferences as essential keys of personality (Alford & Beck, 1997; Young et al., 2003). However, there are several differences between these two approaches have been addressed.

Theoretically, as Beck's cognitive-behavioral model having the major influence on Young's schema theory, the differences between two theories are subtle.

The first theoretical difference is the concept of schema. While Beck's concept of schema refers to cognitive content, Young's concept of schema is border, which incorporates with cognitive, affective, motivational, and behavioral components. Thus, it can be concluded that Young's concept of schema incorporate both cognitive structure and content in terms of Beck's schema (Alford & Beck, 1997; Young et al., 2003).

The second theoretical difference is the concept of mode. Whereas Beck use the term of mode refers to intense psychological reactions that are the mechanisms for survival (Alford & Beck, 1997), Young defines mode as a coping response and emotional state at the given moment (Young et al., 2003).

In addition, the third conceptual difference is the emphasis on coping styles. Although Beck has mentioned about coping strategy, it is not an

important constructs (Alford & Beck, 1997). On the contrary, Young believes that coping style is essential due to its role in schema perpetuation (Young et al., 2003).

Furthermore, another conceptual difference between these two theories is the emphasis placed on childhood experience. Schema theory places important on parenting styles, while Beck's cognitive-behavioral model does not elucidate the specificity about the origins of core beliefs. In contrast, schema therapy provides the most common origins for each of the 18 EMSs (Young et al., 2003).

In practice, two theories share some elements of therapeutic model. Both of them emphasize the importance of educating the client about therapeutic models. Then, the therapist shares the case conceptualization with the client. Homework and self-help assignments are provided to client, and are considered as a central role of change process. However, due to the fact that Beck's cognitive behavioral therapy originally focuses on the Axis I symptoms whereas schema therapy focusing on characterological problems, there are several fundamental differences in therapeutic model.

First, schema therapy begins from the "bottom up" process, while Beck's cognitive behavioral therapy uses "top down" process. In other words, schema therapists begin at the EMS level, and then gradually link these EMSs to more accessible thought. Beck's cognitive behavioral therapy, in contrast, begin with automatic thought level, and later move to focus on core belief.

Second, schema therapy places important on experiential work, such as imagery and dialogues, both in assessment phase and changing phase. On the contrary, Beck's cognitive behavioral therapy does not emphasize experiential techniques as central of treatment.

Finally, two theories view the role of therapeutic relationship in very different way. Beck's cognitive behavioral therapy views the therapeutic relationship as a vehicle to motivate the clients to comply the treatment. In contrast, schema therapy view therapeutic relationship as one of four primary components of change. The therapeutic relationship is utilized as limited reparenting in order to corrective emotional experience. Also, in terms of relationship style, schema therapist adopts empathic confrontation more than collaborative empiricism.

3.4.2 Psychodynamic approaches

Schema theory share many characteristic with psychodynamic approach. Obviously, both of them believe that the current problems are the result of childhood experience. Therefore, both of them explore the childhood origin of current problems. Moreover, schema theory and psychodynamic approach place important on the therapeutic relationship. Both of them also believe the important of personality structure and insight of clients as key to effective treatment.

Nonetheless, there are major differences between schema theory and psychodynamic approach. First, psychodynamic therapists have traditionally attempted to remain neutral. In contrast, schema therapists have to be active and directive. Second, traditional psychodynamic is a drive theory, which focusing on sexual and aggressive instinct and having negative view toward human nature. Schema theory, in contrast, emphasize on the unmet core emotional need. Individuals are motivated to maintain a consistent view of themselves and more likely to interpret situation to confirm their beliefs about themselves, others, and world. In this sense, schema theory is more cognitive than psychodynamic approach.

2.4 Research related to schema theory

The previous section explained the relationship between early maladaptive schema and alcohol use. There are more empirical evidences from the literature review regarding schema theory, which can divide into 3 parts: research on EMS, research on coping style, and research on schema mode.

2.4.1 Research on early maladaptive schema

The literature review on early maladaptive schema used in this study can group into 2 parts: research that uses early maladaptive schema to study alcohol and substance use and research on early maladaptive schema explaining behavior of college students and non-clinical people.

2.4.1.1 Research on early maladaptive schema and alcohol and substance use

The evidence from literature review documented that there is a relationship between EMS and alcohol use. There were 2 groups of population in these studies: patients with alcohol abuse and alcohol addiction and college students.

The studies in alcohol abused and alcohol dependent population

There are 5 studies examining the relationship between early maladaptive schema and alcohol use in patients.

The first study was conducted by Brotchie, Hanes, Wendon, and Waller (2007) to compare EMSs between 97 paients with alcohol abuse and patients with opiates use and control group of 87 non-clinical people. It was found that the patients had EMSs higher than the control group 11 out of 15 dimensions. There were only Failure, Self Sacrifice, Unrelenting Standard, and Entitlement dimensions, which were not statistically significantly different.

The second study by Roper, Dickson, Tinwell, Booth, and McGuire (2010) also compared early maladaptive schema between 50 alcohol-abused patients and 50 people in conrol group. After the treatment, the patients still had maladptive schema in Emtional Deprivation, Mistrust, Defectiveness, Failure, Dependence, and Subjugation more than control group.

The third to the fifth studies were conducted by Shorey et al., a group of researchers who play an important role in studying the relationship between early maladaptive schema and alcohol and substance use.

In the third study, Shorey, Anderson, and Stuart (2011) made a comparison of early maladaptive schema between 40 pairs of patients with substance dependence and their spouses. He found that patients had early maladaptive schema in Defectiveness, Failure, Dependence, Vulnerability to Harm, and Insufficient Self-Control were higher than their spouses while the partners had Self-Sacrifice schema higher than the patients.

In the fourth study, Shorey, Stuart, and Anderson (2012) compared EMSs between a group of female patients with substance dependence who underwent treatment and a control group of female college students. The result

indicated that the patients had EMSs more than a control group. The difference was in a moderate effect size (d > .50) in 12 out of 18 dimensions: Abandonment, Mistrust, Defectiveness, Failure, Dependence, Vulnerability, Enmeshment, Entitlement, Insufficient Self-Control, Subjugation, Negativity, and Punitiveness.

The fifth study by Shorey, Stuart, and Anderson (2013) studied in a group of early adult male patients who received a treatment for alcohol and substance dependence. They had higher rate of early maladptive schema than college students in the same ages. The differences were in a moderate effect size (d > .50) in 9 dimensions: Abandonment, Mistrust, Defectiveness, Failure, Dependence, Vulnerability, Enmeshment, Insufficient Self-Control, and Negativity. Notably, the fourth and the fifth studies are correlated as both indicated that Insufficient Self Control was the largest effect size early maladaptive schema (d = 1.15 and 1.17 respectively).

In summary, EMSs seemingly relate to substance abuse and dependence because the groups with substance abuse or alcohol dependence had different EMSs from control groups.

Studies in students population

In addition to patient population, there are also studies in students. Nonetheless, there are limited numbers of studies. The literature review in this section focuses on the relationship between schema and alcohol and substance use behavior in student population. Muris (2006)'s study was conducted in a 12-to-15-year-old population. He found that early maladaptive schema that related to substance use were Failure, Dependence, and Subjugation.

From the literature review, there are a few studies examining the relationship between schema and alcohol use in student population. Thus, more studies are reviewed to find more relevant evidences whether or not schema can explain other behaviors of students or other populations besides psychiatric patients.

2.4.1.2 Research on early maladaptive schema explaining behaviors of students and non-clinical population

From the literature review, there are some studies using construct of early maladaptive schema in student and non-clinical populations. The first group is the research on psychometric properties and the second group is the

research using schema to explain some behaviors of student and non-clinical population.

In the first group, there were studies about a psychometric properties of Young Schema Questionnaire (YSQ) if it was suitable for student and non-clinical population. Theoretically, early maladaptive schema is a continuum in non-clinical people. The differences between non-clinical and clinical groups are the severity and dimension of EMSs (Young et al., 2003).The studies found that schema was indeed a continuum. For instance, Hawke and Provencher (2012) validated the Canadian-French version of YSQ in non-clinical population who was college students in Canada and clinical population in Axis I. They found that a clinical population had higher scores of EMSs than non-clinical population in every dimension, except Entitlement which was not statistically significantly different.

Furthermore, the factorial validity was also tested. The result stated that factor structure of EMSs in student population correlated to the theory and was also similar to clinical population's factor structure. For example, Van Vlierberghe, Braet, Bosmans, Rosseel, and Bogels (2010) used the questionnaire in adolescent aged 12-18 who was non-referred group. They found that YSQ's factor structure was relevant with the theory. They also cited that internalizing and externalizing problem in adolescent correlated to specific early maladaptive schema. Depression correlated to EMSs within Impaired Autonomy and Performance domain such as Failure, Defectiveness, and Dependence, and also Emotional Deprivation. Conduct behavior, on the other hand, associated to Entitlement. Similarly, Kriston, Schäfer, Von Wolff, Härter, and Hölzel (2012) found in the population of 542 college students and 590 non-clinical adults that YSQ's factor structure corresponded to the theory.

The second group is studies finding an association between EMSs and behaviors of student and non-clinical population. Dozois, Martin, and Bieling (2009) studied the relationship between EMSs and sense of humor in 305 college students. They discovered that students who had high degree of EMSs tended to had self-defeating humor. This can lead to the tendency of depression. On contrary, students who had low EMSs were more likely to have more proper sense of humor such as affiliative humor and self-enhancing humor which can lead to be less

depressed. In other words, the higher EMSs a person has, the higher tendency of inappropriate behaviors or problems with adjustment and routine life. Tremblay and Dozois (2009) who studied the relationship between EMSs and aggressive behavior in college students found that Entitlement, Insufficient Self-Control, and Mistrust were the key schemas that could explain aggressive behavior in students. Wright et al. (2009)'s study used EMS as a mediator of the relationship between parenting style and psychological problem in college students. The finding indicated that Vulnerability to Harm, Self-Sacrifice, and Defectiveness were significant maladaptive schemas which mediated between child emotional abuse and emotional neglect parenting styles and depression and anxiety problems. Additionally, Bosmans, Braet, and Van Vlierberghe (2010)'s study whose population were 289 college students stated that EMS was a mediator factor between attachment and psychopathology by using SCL-90 assessment. Particularly, anxiety attachment had an effect on students' psychopathology where Disconnection and Other-Directedness were a mediator variable. Avoidance attachment also led to students' psychopathology having Disconnection and Impair-Autonomy as a mediator variable.

Moreover, there are studies using maladaptive schema in adult and population with physical illness. In adult population, for instance, Bamber and McMahon (2008) examined the relationship between maladaptive schema and occupational stress and work dysfunctions in 249 medical professionals working in NHS. They found that people who had higher maladaptive schema had a high inclination of burnout in exhaustion and depersonalization dimensions. Furthermore, Enmeshment, Self-Sacrifice, and Insufficient Self-Control associated with sickness absence. Almost every dimension of maladaptive schema, except Unrelenting Standard, had a relationship with mental health according to GHQ. The higher EMS, the more tendency of mental health problems than those with low maladaptive schema. Bamber explained that a person who chose to work in certain process and structure similarly to his/her childhood environment and relationship can perpetuate his/her maladaptive schema. This can cause incapability in problem handling and lead to occupational stress. The study of Reeves and Taylor (2007) in the relationship between maladaptive schema and personality disorders symptoms in non-clinical population in 804 people. They found specific personality disorders symptoms

correlated to specific maladaptive schema. For example, cluster A was associated to Social Isolation, cluster B was linked to Insufficient Self-Control, while cluster C was related to various schemas in patient with physical illness. Van Vlierberghe and Braet (2007) studied about the relationship between maladaptive schema and overweighed adolescents aged 12-18. In schema theory, eating is one of coping styles as well as alcohol use. According to the finding, obese adolescents had higher maladaptive schema than a control group in Emotional Deprivation, Social Isolation, Defectiveness, Failure to Achieve, Dependence, and Subjugation. Likewise, Anderson, Rieger, and Caterson (2006) indicated that after controlling democratic data, obesity patients had higher maladaptive schema than a control group in Social Isolation, Defectiveness, and Failure to Achieve as well as the overall score. Anderson et al. (2006) explained that when maladaptive schema is triggered, a person tries to decrease or avoid these negative emotions. Overeating and alcohol use reflect an effort to reduce negative emotions. Hence, a person with higher EMS tends to have more risk.

2.4.1.3 Findings and knowledge gaps in the study of relationship between EMSs and alcohol use

In a previous section, it can be concluded that early maladaptive schema possibly has a relationship with alcohol use. Furthermore, early maladaptive schema can explain some behaviors in students and non-clinical population.

Nevertheless, there are 2 knowledge gaps. Firstly, there have yet been no studies in relationship between EMSs and alcohol use in college student population. The previous studies were regarding EMSs and other behaviors such as sense of humor and mental health status in this population. Hence, there are some possibilities that schema can be apply in order to study alcohol use among college students.

Secondly, although early maladaptive schema has a relationship with alcohol drinking and substance use, those studies did not examine mechanism that links between maladaptive schema and alcohol use. It is important to understand this mechanism because it can inspect the validity of the theory. Moreover, understanding the mechanism underlying this relationship can help generalize the

findings into practice because the different pathways that lead to alcohol use generally indicate different interventions (S. Ball, 2012; Samuel A. Ball, 1998; S.A. Ball, 2005). Schema theory shows that there are 2 mechanisms that lead to behaviors inluding alcohol use. The 2 mechanisms are coping style and schema mode.

2.4.2 Research on coping style

The studies relevant to coping style are reviewed as the detail presented below.

2.4.2.1 Coping style and alcohol drinking

Theoretically, Young and Ball explained that coping style that associates to alcohol drinking can appear in a form of Surrender, Avoidance, and Overcompensation. However, there were no previous studies using coping style in schema theory to study alcohol use. Thus, the studies about coping style in other behaviors were reviewed.

2.4.2.2 Coping style and other behaviors

The number of studies on coping style in schema theory and behaviors is small. According to the literature review, there are 2 studies using both EMSs and coping styles in order to explain certain behaviors.

The first study is Alfasfos (2009)'s study. He examined the relationship between EMSs and coping styles that affected psychiatric symptoms and personality disorders in college students in Palestine. The result showed that both EMSs and coping styles associated to students' psychiatric symptoms and personality disorders. Nonetheless, it studied only the zero-order relationship. The schema process which used coping style as a mediator was not examined in depth. Also, other studies did not study coping style together with schema.

The second study is Lawson, Waller, and Lockwood (2007). They compared EMSs and coping styles in 2 groups of patients with eating disorders: one with obsessive compulsive symptoms, another without the symptoms. They found that the patients with the symptoms had Mistrust and Dependence with behavioral and somatic avoidance coping styles higher than ones without obsessive compulsive symptoms. However, there was no further study in the relationship between maladaptive schema and coping style.

There are also some additional studies using only coping style, but not EMS as a variable. Usually this construct is used to study eating disorders in students and clinical population. For instance, Spranger, Waller, and Bryant-Waugh (2001) conducted a research in a non-clinical group. The finding presented that women with eating disorder in bulimic type had avoidance coping style higher than women who did not have that behavior. Sheffield, Waller, Emanuelli, Murray, and Meyer (2009) also found similar result that Avoidance and Overcompensation coping styles were mediator variables between parenting style and pathological eating.

2.4.2.3 Findings and knowledge gaps

The literature review suggests that even though there are limited numbers of studies of coping styles and alcohol use, there are some empirical evidences explaining the relationship between coping styles and maladaptive behaviors and adjustment in both non-clinical and clinical populations. This is relevant to Young's approach mentioned before. However, there are still some gaps that need to investigate further.

Firstly, there should be more studies in the relationship between coping style and problematic behaviors or other psychological problems. The number of research using coping style as a variable is relatively low and most of them are concerning eating disorders. Findings in this relationship can be a good beginning to use this construct as a variable to study other behaviors, adjustment, as well as personalities in addition to the previous studies. For example, which type of coping style is associated with alcohol use? Is it relevant to Young and Ball's proposed theory?

Secondly, the mechanism of the relationship between EMSs and coping styles that has an effect on behaviors needs to be examined. Although there are previous studies found the correlation between EMSs and coping styles, there are no studies examining the mechanism of the relationship. It can be researched whether or not coping style is a process resulted from triggered EMS and leads to maladaptive behaviors or psychological problems. And, if this idea complies to Young's theory and how it is relevant to his theory. If there is a study using coping style as a mediator variable to examine the theoretical relationship, it can effectively

lead to a throughout and comprehensive understanding the relationship between EMSs and studied behaviors.

2.4.3 Research on schema modes

There are studies in schema modes and alcohol use as well as other studies related to schema modes that are reviewed as describe below.

2.4.3.1 Schema modes and alcohol use

Theoretically, schema mode has a relationship with alcohol use. Young stated that the use of substance for soothing emotional suffering or worries is a result from triggered maladaptive schema. This explanation is comparable to Detached Self-Soother schema mode (Kersten, 2012). In addition to reducing negative emotion, other schema modes can relate to alcohol use as well. In 2009, there was a study about schema mode and substance use in 14 institutionalized patients in Rooyse Wissel, a forensic psychiatric institute (Kersten & van de Vis, 2012). The samples had cluster B personality disorders. They found that different types of personality disorders have different schema modes. However, regardless of the types of schema modes, they all led to alcohol and substance use but in different reasons. The findings they found are illustrated below.

Borderline personality disorder. The purposes of alcohol and substance use can be divided into 4 groups. Firstly, it is used to reduce the feelings of being unaccepted, abandoned, abused, or depressed as a result from using Vulnerable Child mode and Angry Child mode. The reduction of negative feelings is comparable to Detached Self-Soother mode, Self-Stimulator mode, and Detached Protector mode. Secondly, it is used for emotional regulation. Substance use is self-medication to balance or stabilize emotions from changing too expeditiously. Thirdly, alcohol drinks or substance is used because of impulsiveness or anger referring to Angry Child mode and Impulsive Child mode. Lastly, it can be used as self-destructive or self-injury behavior referring to Punitive Parent mode.

Antisocial personality disorder. Alcohol or substance can also be used by this type of personality in 4 modes: Self-Aggrandizer mode or the feeling that one is superior to other people; Predator mode or committing crime or violence with apathy or conscience; Bully and Attack mode or attacking or abusing

with unconcern; Conning and Manipulating mode or controlling or taking advantage of other people without conscience.

Narcissistic personality disorder. Alcohol or substance is used for 4 purposes: Self-Aggrandizer mode to enhance one's self-esteem; Self-Soother or Self-Stimulator modes to decrease empty, isolated, and inferior feelings; Spoilt or Undisciplined Child modes to resist rules or authority; lastly, Angry and Impulsive child mode to respond immature anger and impulsiveness.

However, there are no previous studies about the relationship between schema modes and alcohol use in college students. The literature review, therefore, is carried out in the relationship between schema modes and other behaviors.

2.4.3.2 Schema mode and other behaviors

There are 2 studies using the schema mode construct in their studies that they examined theoretical relationship between schema mode and maladaptive schema. Jerkins (2009) studied schema modes and EMSs of patients with eating disorders. He found that the patients' EMS and schema mode were different from control group. Also, EMS and schema mode were statistically significantly correlated in a large effect size. Nonetheless, the relationship was analyzed from overall score, not from comparing each types of EMS and schema mode. In the second study, Lyrakos (2014) examined the validity of Young Schema Questionnaire and Schema Mode Inventory and the theoretical relationship between these 2 variables. The results stated that Happy Child and Healthy Adult modes had a negative relationship with every aspect of EMSs. Furthermore, other schema modes had a varied relationship with EMSs. Yet this study aimed to examine the relationship between these 2 constructs, but not to study the mechanism that can predict behavior or personality. These 2 studies are empirical evidence supporting Young's theory.

There are also studies in schema modes and maladaptive behaviors, mental health, and deviant personality problems in clinical population. Saldias, Power, Gillanders, Campbell, and Blake (2013) found that schema mode was a mediator variable connecting parenting style and non-suicidal self-injury behaviors. In mental health aspect, Voderholzer et al. (2014) compared EMSs, schema modes, and childhood traumatic experiences in patients with obsessive compulsive disorders,

patients with chronic illness, and patients with eating disorders. They found that all the 3 groups had statistically significantly different types of EMSs, schema modes, and childhood traumatic experiences. This study is different from the first study that it did not find the relationship between schema and schema mode.

In the studies of schema mode and deviant personalities, Lobbestael et al. (2008) conducted a research on the relationship between personality disorders and schema modes. They found that each types of personality disorders specifically used different schema mode. Eurelings-Bontekoe, Luyten, Ijssennagger, Van Vreeswijk, and Koelen (2010) also studied the relationship between psychoanalysis theory's personality organization, EMSs, and schema modes in 117 out-patients. The results found that the patients with different personality organizations had different EMSs and schema modes. These 2 studies point out that different personalities have different EMSs and also utilize particular schema modes.

In spite of the fact that there are no studies in students or non-clinical population, there are some evidences supporting the approach that schema mode is continuum and found in student group. Also, students used more adaptive schema mode than clinical group. For example, Lobbestael, Van Vreeswijk, Spinhoven, Schouten, and Arntz (2010) who examined the psychometric properties of Schema Mode Inventory (SMI) in non-clinical group, Axis I patients, and Axis II patients. They found that the validity of SMI was .79 - .96 and had a good factor structure. Moreover, the Axis II patients had a higher score than Axis I patients and non-clincal group in almost every maladaptive schema modes, except Happy Child and Healthy Adult mode which the non-clinical group had the highest score while Axis I patients had the second highest score, and Axis II patient had the lowest score.

2.4.3.3 Findings and knowledge gaps

There are 3 main points that can be summarized from literature review which support proposed concept of schema modes. Firstly, each schema modes have a different relationship with different kinds of EMSs. This is relevant to the theory that believes when EMS is activated; it will induce certain types of schema mode. Secondly, schema modes can be found in both non-clinical and clinical groups. However, the severity is different between these 2 groups and non-clinical group tends to have more adaptive schema mode. Thirdly, empirical evidences indicate that

schema mode probably has a relationship with alcohol use. Yet there are limited numbers of these evidences and they generally study in only clinical population.

For the knowledge gaps, there are 2 issues from literature review. Firstly, there are relatively limited numbers of studies in schema modes especially in non-clinical group as they are usually conducted only in clinical group. Therefore, it is necessary to develop knowledge about schema mode in other populations. In practice, there are psychologist adopting schema theory as a base and applying schema mode theory into practice with children and adolescents as well as non-clinical group. For instance, Atkinson (2012) used schema mode model in order to conceptualize interaction process in married couples. Geerdink, Jongman, and Scholing (2012) applied schema mode model in therapy in children and adolescents.

Secondly, there are no examinations in mechanisms of theoretical relationship between EMSs that affects schema modes before leading to maladaptive behaviors. In order to understand and examine Young's mechanism relationship of schema theory, there should be studies in the influence of EMS upon schema mode and using schema mode to explain one's behaviors. Moreover, this suggestion can be beneficial as a mean to apply theory into practice.

2.5 Literature review summary, knowledge gaps, and research conceptual framework

College drinking is an important problem. Every year, there are many students getting in an accident or getting in troubles either to themselves or to other people caused by alcohol drinking. However, the problem's prevention and solution are not simple because of its complexity. Also, the drinking pattern and its effects of students are different from other populations. It is necessary to study and conduct a research about knowledge in alcohol drinking in this population which can lead to primary and secondary prevention as well as in individual, community, and policy intervention.

The knowledge reviewed in alcohol use among college students in this study is relevant to psychological factors which are individual-level factor. There are several approaches and theories that can be applied to explain the alcohol use. One of

these theories is schema theory developed by Jeffrey Young. Here are summary and knowledge gaps from the literature review in this research:

2.5.1 Summary of findings in schema theory and alcohol use among college students

There are 3 key constructs in schema theory: early maladaptive schema, coping style, and schema mode. From the review of relationship between these 3 constructs and alcohol drinking, we can summarize that:

2.5.1.1 Theoretical relationship and empirical evidences between early maladaptive schema and alcohol use

Schema theory emphasizes the importance of EMS as a predisposing factor which can lead an individual who has tendency or vulnerability to different styles of alcohol drinking. This EMS influences drinking behavior from initial drinking to continuous drinking (Ball, 1998; 2003; 2012). Every aspect of EMSs probably has a relationship with alcohol use among college students.

The empirical evidences from research are also correlated to the theory. Firstly, alcohol addiction patients had higher maladaptive schema than non-clinical control group such as the studies of Shorey et al. (2011); Shorey et al. (2012); and Roper et al. (2010). Also, there is a relationship between maladaptive schema and substance use in students such as Muris (2006)'s' study.

From literature review, it can conclude that there are evidences confirming that EMS is related to alcohol use as Young and Ball have purposed.

2.5.1.2 From EMS leading to alcohol use: an examination of the pathway of schema's operation

According to the schema theory, alcohol use is not a direct result of EMS. Nonetheless, when schema is aroused, it leads to the process called schema operation or schema process. These processes induce alcohol use. The schema process can be explained by 2 models: coping style and schema mode.

About coping style, Young stated that there are 3 coping styles: Surrender, Avoidance, and Overcompensation. Ball (1998, 2012) explained that all 3 coping styles are a process leading to alcohol use. And it depends on each person's EMS. Nonetheless, there are no empirical studies supporting this relationship.

Schema mode is emotional states and coping responses which a person uses when his/her schema is triggered. Schema mode is different from coping style as it is a moment-to-moment state while coping style is a stable trait. Alcohol use is a result from schema mode that a person decides to use when schema is stimulated; for example, drinking for reducing negative emotions according to Detached Self-Soother or drinking impulsively according to Undisciplined Child. There is a study from literature review using schema mode to explain substance use behavior which is Kersten and van de Vis (2012). Nevertheless, this study was conducted in substance addiction patients in forensic psychiatric institute, not in a student population.

From the literature review, we can sum up that there are no studies examining schema process which leads to alcohol use. There are also a few studies examining schema process to other behaviors, in particular in eating disorders.

2.5.2 Knowledge gaps in schema theory and alcohol use among college students

There are 2 key gaps found from the literature review in order to understand alcohol use among college students. Firstly, although there are empirical studies finding that schema has a relationship with alcohol use, they usually studied in patients with alcohol dependence, not in student population. Secondly, constructs of schema processes in schema theory, namely coping style and schema mode, are not used to validate theoretical explanations if they can explain focused behaviors and how accurate they can be. Like other behaviors, this gap also applies to alcohol use among college students.

From the knowledge gaps mentioned previously, this research aimed to study the effects of EMSs on alcohol use among college students, while schema modes served as a mediator factor in accordance with schema theory. The literature review was conducted in order to find out these following questions. Firstly, schema theory is generally used to explain patients' behaviors. Is it possible to apply schema theory in the study in student who is not a clinical population? Secondly, what is the importance of studying schema process? Why do we need to study this? Thirdly, why the research needs to study schema mode instead of coping style as a mediator variable?

2.5.2.1 The application of schema theory in student and non-clinical population

The question is, if schema theory is developed to explain and provide therapy to patients with personality and adjustment problems, can it be applied to alcohol use in a non-clinical population like in students? And how much can it be applied? Despite of no studies in the relationship between EMSs and alcohol use among students, there are some evidences supporting the idea of applying this theory or using it as a framework to study students' behavior: firstly, the proposed theory by Young and other scholars and secondly, empirical evidences from research in non-clinical groups.

Young et al. (2003) explained that EMS is a cognitive structure found in every person. Its characteristic is dimensional and continuum. In other words, an individual has maladaptive schema in every dimension. However, some dimensions can be more intense than another. If an individual has high and intense EMS in certain dimension, it is more likely to be easily activated by the situations that relates to that EMS and later followed by severely negative emotions. Therefore, if an individual has several EMSs, they tend to be easily triggered by various situations. On other hands, the less an individual has EMSs, the less he/she will be affected by situations less and the lower the negative emotion's severity. It means students have EMSs as well, perhaps in less severity and causes less problems in adjustment and daily routine than clinical groups. Wright et al. (2009) explained the relationship between EMSs and adjustment in college students. They stated that EMS is a resulted from upbringing. Therefore, each student has different degrees of stress even when facing same situations. University life is indeed a transitional period that heightens student's vulnerability. A student may be incapable to properly cope with problems and fail to accomplish psychosocial tasks in this stage such as identity consolidation or intimacy development.

With regard to alcohol use, it is also continuum in several degrees from never drink, occasionally drink, socially drink, and regularly drink (Dawson et al., 2005). Schema theory believes that a person inclines to drink alcohol in order to avoid or decrease negative emotions as a result from triggered EMS. An individual who has low level of EMS has fewer tendencies to be emotionally evoking

and drink alcohol. On the contrary, an individual with high EMS tends to be emotionally triggered more easily and drink alcohol more heavily. Although students do not drink as much as patients, this concept can also be applied to them. A student with high EMS is more likely to drink more than a student with low EMS.

The empirical evidences from literature review which support the application of schema theory in students' behaviors and mental health can divided into 2 groups. Firstly, the studies aimed for investigating the psychometric properties of Young Schema Questionnaire. The studies found the factor structure of proposed schema theory in students and patients are consistent (Kriston et al., 2012; Van Vlierberghe et al., 2010). Also, schema is continuum as Young claimed (Hawke & Provencher, 2012). Secondly, the studies that used schema theory to study behaviors, personality, and mental health of students and non-clinical groups are limited. For instance, Dozois et al. (2009)'s study in humor and depression, Tremblay and Dozois (2009)'s study in aggressive behavior, Bosmans et al. (2010) 's study in mental health and psychopathology, Bamber and McMahon (2008)'s study in occupational stress and burnout, Van Vlierberghe and Braet (2007)'s study) in personality disorders, and Anderson et al. (2006) 's study in overweight and obesity.

Regarding schema mode, although it is developed for explaining patients with personality disorders, it can be a construct to apply in non-clinical groups or high functioned patients. Young et al. (2003) explained that non-clinical group also has schema mode, but it is different from patient's schema mode. Firstly, non-clinical group's schema mode is more integrated while patient's one is more split or disassociated. Secondly, non-clinical people's schema mode is more flexible, more suitable in each situation, and more open to new experiences. Lastly, non-clinical group uses 'adaptive' schema mode more than 'maladaptive' one. A non-clinical group uses Healthy Adult mode more often than dysfunctional mode. Healthy Adult mode can reduce the harshness and moderate other dysfunctional modes. For example, when a person becomes angry, Angry Child mode is operated. But Healthy Adult mode can help hold the anger down and direct behavior to become more in control. Nonetheless, patients may act out accordingly to Angry Child mode because their Healthy Adult mode works very limited. Therefore, schema mode in patients and

non-clinical people is continuum. Young has summarized the differences of schema mode between non-clinical and clinical population below:

Clinical group		**Non-clinical group**
Dissociated	<->	Integrated
Unacknowledged	<->	Acknowledged
Maladaptive	<->	Adaptive
Extreme	<->	Mild
Rigid	<->	Flexible
Pure	<->	Blended

From the theory and the empirical evidences, it can be confirmed that there are possibilities to apply schema theory to explain alcohol use in college students in this research.

2.5.2.2 The importance of study the mechanism of EMS and alcohol use

The study of the mechanism in variables' relationship has been adopted in cognitive psychology study for long time. Cognitive psychology primarily aimed to study mechanism which associates the stimulus to the response as in its S-O-R model. This is different from behaviorism that studies only the relationship between stimulus and response as in its S-R model (MacKinnon, 2008). Several cognitive processes are studied in order to explain human's behaviors such as attention, perception, memory, problem solving, and languge process. Understanding these processes is beneficial to develop theories and implement the knowledge.

An examination of relationship's mechanism is useful for developing theories, in terms of understanding certain phenomena or behavior. Hence, a social scientist or a behaviorist needs to develop conceptual framework. Basically, theory is a set of rational explanations defining how one construct affects another construct. Therefore, theory plays an important role to make understand, explain, and predict situations or social phenomena (Correia et al., 2012). Nonetheless, these theories are needed to be validated if their set of explanations is correlated to real world situations or not. In the same way, to use schema theory to explain behaviors, it

needs to be examined if schema affects behaviors and if its mechanism that stimulates behaviors is accurate or not. If the mechanism is accurate, the following question is how is the “weight” or “effect size” of the mechanism. The mechanism can be inaccurate as well. For example, although the findings cite that schema indeed has an effect on certain behavior, the process that leads to that behavior can be varied or the relationship between these two variables is a result from other variables which is not the mechanism that the theory has proposed. Therefore, it is necessary to validate theoretical relationship and its mechanism if it is relevant to empirical data conducive to improve original theory and develop new knowledge (Wiratchai, 1999).

In addition to develop and improve theory, the understanding in mechanism of the relationship will be useful to apply knowledge into practice. Kazdin (2007) said it can lead to developing an intervention which is appropriate in aspects of program’s orders and parsimony. Furthermore, the understanding can help improve and develop a intervention suitable for each target group and circumstance.

In conclusion, it is nessesary to examine the mechanism of the relationship between schema, schema process, and alcohol use in college students. Because it can yeild better understanding in this behavior in students and help pratitioners to generalize the knowledge into developing prevention program in both primary and secondary levels.

2.5.2.3 The necessary to study schema mode in addition to the study of early maladptive schema

According to Young’s schema theory, both coping style and schema mode are considered as schema process or schema operation, which occurs when EMS is triggered and affects behaviors, personality, and mental health. In particular, coping style and schema mode are the set of explanation about “how” schema affects behaviors. However, these 2 processes are different as coping style is more consistent and indicates individual’s tendency as a trait. Schema mode, on the other hand, is changeable depending on situations as a state. This research chose to study schema mode according to this difference because of following reasons.

Firstly, alcohol use in students is caused by personal and situational factors. Despite of students’ differences of drinking tendencies and styles (as a trait), each individual does not always drink the same amount of alcohol nor

always have the same reason for drinking. For example, an individual who consumes 10 standard drinks in average does not consume 10 standard drinks every time. He may consume more than 10 standard drinks when he argues with a girlfriend, finished an exam, or in special occasions. He may drink less than 10 standard drinks when he feels negatively with drinking friends or when he worries about his work. As schema and coping style are like a trait which is fixed, they can hardly give a detailed and comprehensive explanation of process leading to alcohol use. The use of schema mode which is an emotional states or a response to problems can provide a better understanding in the process of how EMS, when triggered, can lead to alcohol use. For instance, a student with Abandonment schema may drink alcohol to reduce negative emotions occurred by rejection or difficulties in relationship with friends (as when Abandonment is triggered, Vulnerable Child is operated, and then Detached Self-Soother is utilized in order to decrease negative emotions), to socialize because of avoiding being abandoned or rejected by friends (as Compliant Surrender operating), or to commit self-punishment (as Punitive Parent operating). Thus, the understanding in a process when maladaptive schema is triggered leading to the use of which schema modes and how it leads to alcohol use can help a practitioner to apply the findings in order to create a more effective alcohol drinking prevention program.

Secondly, schema mode becomes more common to use in non-clinical population. It is also used to develop an intervention for patients with substance use disorder. At first, Young developed schema mode concept to use in individual with personality disorders. However, later in clinical and practical aspects, schema mode concept becomes more commonly used in non-clinical individual. For instance, Atkinson (2012)'s study in interaction style in spouse, Geerdink et al. (2012)'s study in therapy in children and adolescents, or Ball (1998; 2000) 's studies in manualizing treatment program for patients with substance use disorder.

Thirdly, schema mode can provide more practically benefits than coping style. Theoretically, Young et al. (2003) suggested the use of schema mode instead of coping style in many cases. One case is a person who employs excessively Avoidance coping style or externalized problem. Considering Young's theory, an individual often uses substance for avoiding and reducing negative emotions. Moreover, the use of substance can be categorized as externalized problem.

Therefore, using schema mode to explain alcohol use is useful for implement the findings into designing prevention and treatment program in primary and secondary levels.

Thus, the schema mode is selected to be as a conceptual tool to understand alcohol use in college students. The research conceptual framework from literature review will be presented in following section.

Research conceptual framework

In this research, schema theory of Young et al. (2003) is used to conceptualize the college drinking phenomena. The theory emphasizes early maladaptive schema (EMS) as a person's cognitive structure which affects the perception of one's self, others, and world. This EMS also influences an individual's adjustment and interpersonal relationship with other people.

Early maladaptive schema also effects on alcohol use among college students. When individuals encountering with the situation they are over-sensitive, their EMSs are activated. Subsequently, the EMS activated drives the individual to utilize coping responses or have any emotional states. According to Young's schema theory, these coping responses or emotional states at any given situation can refer as schema modes. According to the literature review, certain schema modes are associated with alcohol use. For instance, the drink of alcohol due to boredom, impulsivity, careless decision making could refer to the utilizing of Impulsive Child mode and Undisciplined Child mode. Or, the alcohol the drink of alcohol to decrease negative emotions could refer to the utilizing of Detached Self-Soother mode.

According to the literature review, it can be concluded that early maladaptive schema effect on alcohol use among college students via schema mode which serve as mediator factor. The structural relationship can be outlined in research conceptual framework as in Figure 2.7

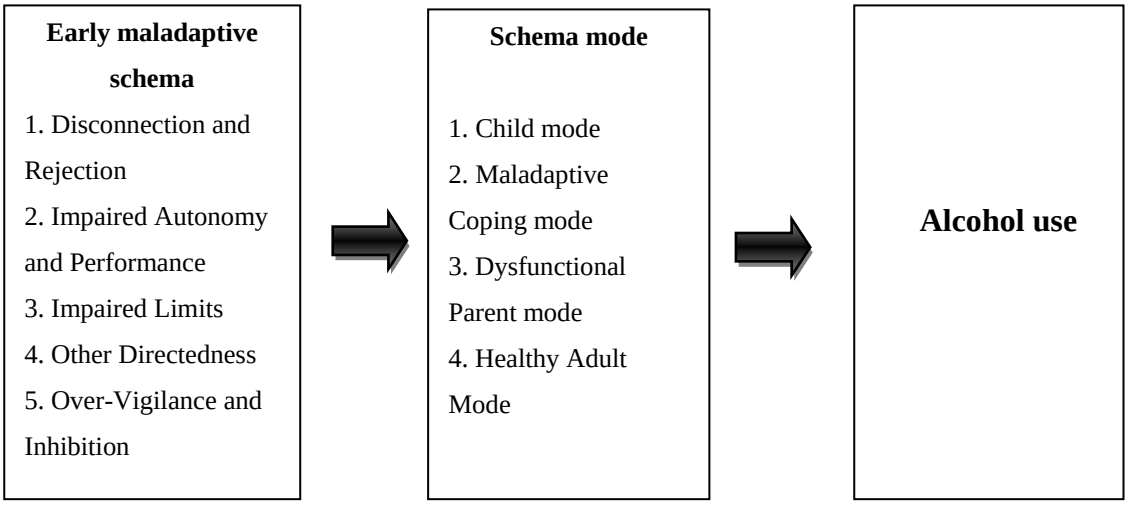

Figure 2.7 the research conceptual framework of the current study

The hypothesis of the current study

From the research conceptual framework, the author developed the structural model of the relationship among early maladaptive schema, schema modes and alcohol among college students. The author hypothesized that the structural model of the relationship between early maladaptive schemas and alcohol use among students, which schema modes serves as mediating factor is fit with empirical data. The hypothesized model of this study is illustrated in Figure 2.8.

According to hypothesized model, it can be broken down into 3 sub hypotheses in accordance with sub research questions:

Sub hypothesis 1: Schema domains are associated with alcohol use among college students.

Sub hypothesis 2: Each schema domain has a specific relationship with schema modes.

Sub hypothesis 3: Schema modes serve as mediating factor underlying the relationship between schema domain and alcohol use.

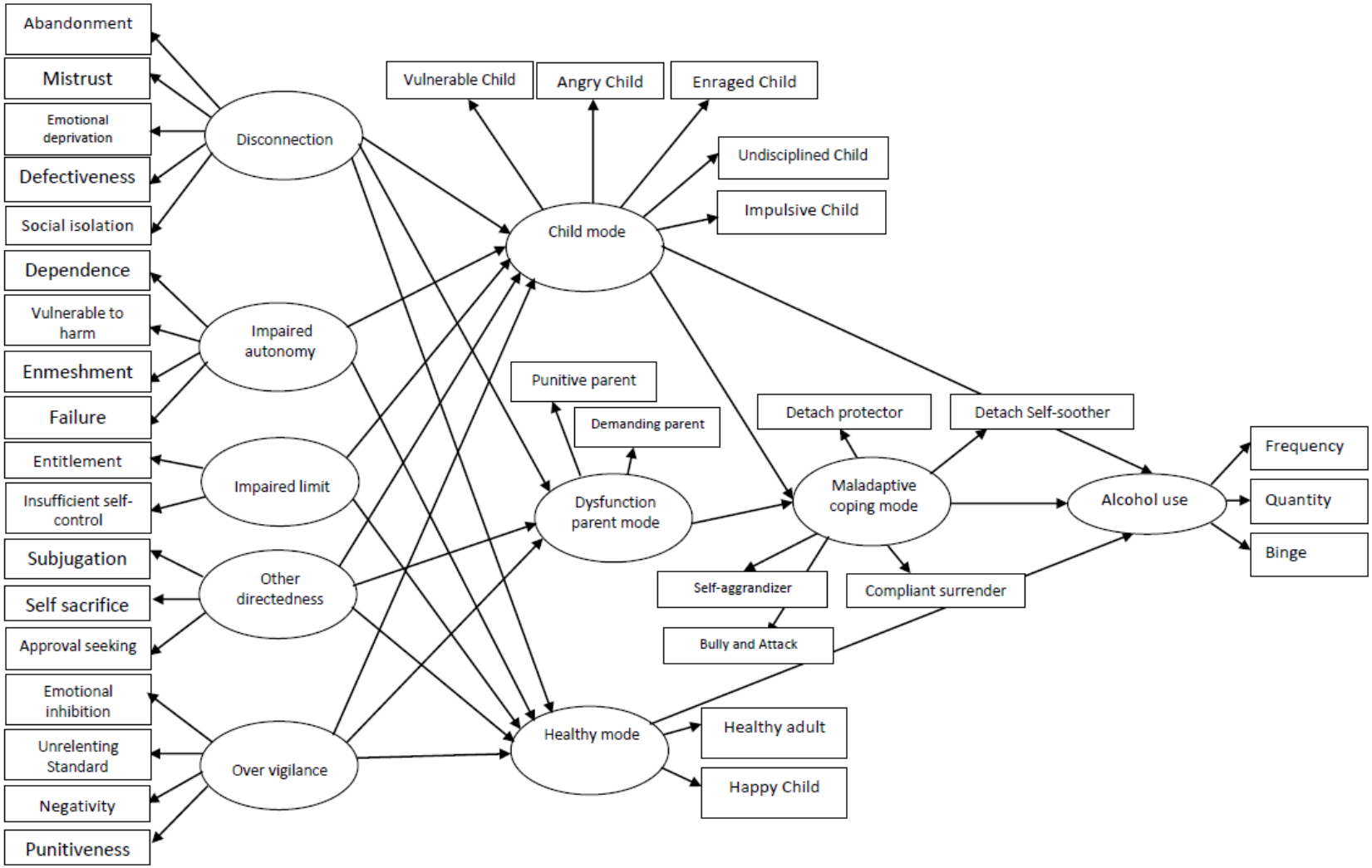

Figure 2.8 the hypothesized model of the current study

CHAPTER III
METHODOLOGY

The current study aimed to develop and investigate the structural relationship among early maladaptive schemas (EMSs) and alcohol use among college students, which schema modes were identified as mediating factors. This study was quantitative research, using mediation analysis with structural equation modeling. The details of study methodology are presented in 4 parts: population and sample, research instruments, data collection, and statistical analysis.

Population and Sample

Population

The population of this study was undergraduate students registered in the academic year 2014-2015 in Chiang Mai, Thailand. According to the report of Office of the Higher Education Commission (http://www.info.mua.go.th/information/index.php), there were 92,976 undergraduates registered in the academic year 2013 in Chiang Mai.

Sample

The sample size of this study was estimated, using following formula (Saengkeaw, 1998).

$$n = \frac{p(1-p)}{\frac{e^2}{Z^2} + \frac{p(1-p)}{N}}$$

Where n = sample size

N = population size

e = margin of error for the prevalence estimation; in this study e = 4% or .04.

Z = confidential interval; in this study Z = 2.58 for 99% confidence.

p = the expected proportion of the characteristic of interest, which is proportion of undergraduate students who drink alcohol for this study. Data from the study of Lapyai (2006) indicated that the proportion of undergraduates who drink alcohol was 72.9%. Therefore, in this study p = .729 and 1-p = .271.

$$n = \frac{.729 \times .271}{\frac{.04^2}{2.58^2} + \frac{.729 \times .271}{92967}}$$

$$= \frac{.197559}{.000653}$$

$$= 814.69$$

The results of sample size calculation indicated the adequate sample size of this study was at least 814.69 or 815 to ensure for 99% confidence. Additionally, sample size should be large enough achieving adequate statistical power. Kline (2011) and Wiratchai (1999) suggested that an ideal sample size-to-parameter ratio of structural equation modeling should be 20:1. In this study, the observed variables were 35 (18 for EMSs, 14 for schema modes, and 3 for alcohol use). Hence, the adequate sample size should be 700. The calculated sample size mentioned above was large enough to ensure representativeness and sufficient statistical power. Nonetheless, to compensate potential analytic problem due to missing data, the author added 10% to the sample size, resulting in 897.

In the current study, cluster random sampling was applied. The author divide the population into clusters by their study sections where they generally

assigned based-on their study program. The author, then, randomly drew some of clusters from the list until a minimum of 897 participants. After collecting data, the actual sample size in this study was 973.

Research instruments

There are 3 research instruments have been use in the current study.

1. Young Schema Questionnaire-Short Form-3 (YSQ-3s).

Developed by Young in 1990 (cited in Young et al., 2003), the YSQ-S was constructed by choosing the 5 highest factor loading item for each EMSs from Young Schema Questionnaire-Long Form (YSQ-L). The YSQ-3S, the current version, is a 90-item self-report instrument for assessing 18 early maladaptive schemas. Each EMS has 5 items with a 6-step Likert scale ranging from 1 (*completely untrue of me*) to 6 (*describes me perfectly*). A higher score indicates a higher level of the respective EMS.

Translation procedures

The YSQ-3s was adapted to the Thai language by a panel of translators, and then the questionnaire was back-translated blind into English by a qualified linguistic who is a Thai-English translator. The discrepancy between the original version and the back-translated version was reviewed by the same panel of translators. The translated version of YSQ-3s were reviewed, discussed, and revised. Then, the pilot study was conducted with 30 undergraduates to examine the language comprehensibility, and was modified utilizing the feedback given by the pilot study group.

Psychometric properties of YSQ-3s

The psychometric properties of the translated version of YSQ-3s were investigated in the pilot study conducted by the author. It was found that YSQ-3s had adequate internal consistency, the Cronbach's alpha coefficients range between .619 to .846, and composite reliability was .946.

2. Schema Mode Inventory (SMI).

The SMI was developed by Young, Arntz, and Atkinson (2007), It consists of 118 items aimed to assess 14 schema modes. The items of SMI were 6-step Likert Scale ranging from 1 (*never or almost never*) to 6 (*All of the time*). Lobbestael, Van Vreeswijk, Spinhoven, Schouten, and Arntz (2010) documented the psychometric properties of SMI, which indicated acceptable to good internal consistency (Cronbach'α ranged between .79 - .96) and discriminant power to differentiate clinical sample and normal controls.

Translation procedures

The SMI was adapted to the Thai language by the procedure similar to YSQ-3s. At the beginning, the SMI was translated into Thai language by a panel of translators. Subsequently, the questionnaire was back-translated blind into English by a qualified linguistic who is a Thai-English translator. The discrepancy between the original version and the back-translated version was reviewed by the same panel of translators. The translated version of SMI were reviewed, discussed, and revised. Then, the pilot study was conducted with 30 undergraduates to examine the language comprehensibility, and was modified utilizing the feedback given by the pilot study group.

Psychometric properties of SMI

According to the pilot study, the psychometric properties of the translated version of SMI were supported. The internal consistency of SMI ranged from .633 to .848, indicating sufficient to good reliability.

3. Alcohol Use Questionnaire

The Alcohol Use Questionnaire is comprised of 3 items for assessing alcohol use behaviors. The first item aims to assess frequency of use (How many days on average in a month did you drink alcoholic beverages?). This second aims to assess quantity of use (How many standard drinks on average did you drinking in an occasion?). The third question aims to assess binge drinking (How many times on average in a month did you drink alcohol beverages 5 standard drinks or more in 2 hours (for men) or 4 standard drinks or more in 2 hours (for women)?). These items

were Likert scale ranged from 1 to 9. According to the pilot study, the reliability of Alcohol Use Questionnaire was .865.

Data Collection

Procedures

Before collecting data, the author contacted the institutions and university for permission to proceed with the data collection. The participants were recruited via a classroom invitation by the author. All participants were provided with a brief description of the study, a guarantee of anonymity, and the time needed to complete the questionnaires. No incentives or course credit were provided. In order to avoid any coercion, to minimize the disruption of their lectures and activities, and to ensure voluntary participation, the potential participants were given time to consider whether they wish to participate. And, they were invited to take the questionnaires at a time convenient to them, which were not significantly impact on their study or activities. The potential participants had fully autonomy to participate the research. They could consider coming to the initial appointment or not. If coming, it would be implied that they participated the research voluntarily.

Prior to administration of the questionnaires, the written informed-consent was obtained from all participants. Additionally, all participants were informed that they could withdraw from the research process at any time without penalty of any kind. The series of research questionnaires were administered; beginning with Alcohol Use Questionnaire, following by YSQ-3s and SMI. The author also emphasized on the anonymity. They were told not to provide any information such as name that might serve to identify them. Additionally, participants were asked to send back the questionnaires in enclosed envelope in order to maximize the confidentiality and anonymity. If the answering of the questionnaire induced stress, anxiety or other negative emotions of the participants, the author would provide basic counseling service to them.

Ethical consideration

The study protocol was approved by the Mahidol University Institutional Review Board. The data collection processes started after the protocol had been approved. All participants were provided with a brief description of the study, a guarantee of anonymity, and the time needed to complete the questionnaires. Written informed consents were obtained from all participants. Basic counseling service was provided in order to minimize potential harm or psychological distress induced by answering the questionnaires.

Statistical analyses

Missing data analysis and management

Data screening process revealed that, in total, 973 participants completed the YSQ-3s, SMI, and Alcohol Use Questionnaire with 907 responses collected. The response rate was 6.78%. Hair, Black, Barbin, Anderson, and Tatham (2010) proposed the guideline that less than 10% of missing data can generally be ignored. However, to determine the patterns of missing data, the Little's MCAR test was conducted. The result of test was a non-significant statistical level (χ^2 = 703.756, df = 697, sig = .427), indicating that the pattern of missing data was missing completely at random (MCAR). Any of the imputation method for missing data can be applied. The author preferred expectation-maximization (EM) algorithm due to less bias of parameter estimation and no reduction of statistical power, when comparing with the traditional method such as listwise deletion and pairwise deletion (Enders, 2010).

Statistical analyses

1. Descriptive statistics. A variety of descriptive statistical techniques, namely frequency, percentage, mean, standard deviation, skewness, and kurtosis, were performed to describe the characteristics of the sample and variables of this study.

2. Structural equation modeling. Structural equation modeling was performed to examine the structural relationship among EMSs, schema modes, and

alcohol use among college students. There are two major advantages of structural equation modeling compared to traditional mediation analysis such as causal step and other regression-base mediation analysis. First, structural equation modeling can estimate and test more complicated mediation models (e.g., multiple mediating variables, multiple outcomes) in single analysis with more accuracy. Second, structural equation modeling can reduce measurement error by using factor analytic technique, which produces more accuracy and less bias of parameter estimation (MacKinnon, 2008).

Structural equation modeling refers to a diverse set of statistical techniques which used to validate a theory by specifying a model that represents the theoretically plausible relationship between the constructs. Then, researchers test how well the hypothesized model conceptualized by researchers fit with empirical data. Whereas, the null hypothesis (H_0) is the hypothesized model is fit with empirical data. The alternative hypothesis (H_1) is the hypothesized model in not fit with empirical data (Hair et al., 2010; Schumacker & Lomax, 2010; Wiratchai, 1999). In the current study, the author applied two-step modeling approach proposed by Anderson and Gerbing (1988) for the hypothesis testing procedure. The first step was the testing of measurement model, using confirmatory factor analysis (CFA). When finding the appropriate measurement model, the author further moved to the second step. The second step was to examine and develop the structural model of relationship between the variables of the study.

Confirmatory factor analysis. At the beginning, the author separately tested unifactorial models to validate the convergent validity of items of each EMS and schema modes. For illustration, the author aims to validate measurement model of Emotional Deprivation in this step. The items of the EMS are brought into the model. The factor loadings of the items indicate good convergent validity.

Then, the author brought each unifactorial model in their respective schema domain and the main type of schema modes for discriminant validation. For discriminant validity at EMS and modes level, the author compared fit indices of each schema domain models and each type of schema mode proposed by Young et al. (2003) with one factor model (all individual items in schema domain or type of schema mode considered to load on one latent trait). The good discriminant validity of

EMS or modes is indicated by the better fit of hypothesized model than the one factor model. For illustration, the author aims to validate measurement model of Rejection and Disconnection domain. The items of EMSs belonging in this domain, including Emotional Deprivation, Abandonment, Mistrust, Social Isolation, and Defectiveness are brought into the measurement model (see Figure 3.1a). If the fit indices of Young's Rejection and Disconnection model are better than the one factor model (see Figure 3.1b), the discriminant validity of EMSs in this domain are empirically supported. For discriminant validity at items level, it is considered by the factor loading of each item. The good discriminant validity of items is supported by no cross-loading on other latent variables.

Subsequently, the author tested the second-order factor structure of schema domains and types of schema modes. The author parceled individual items into their represented EMS or mode. The item parceling approach was conducted for reducing the bias due to non-normal distribution and increasing the stability of parameter estimation in a highly complex model (Kline, 2011; Little, Cunningham, & Shahar, 2002; Matsunaga, 2008). The author tested the factor structures of five second-order model of EMSs and four-second order model of schema modes, which were proposed by Young et al. (2003). In addition, previous research documented the alternative second-order model of EMSs. In order to reduce confirmatory bias, the author compared Young's theoretical model with alternative mode: one second-order model, Calvete, Orue, and González-Diez (2012), Saritaş and Gençöz (2011), and Soygüt, Karaosmanoğlu, and Çakir (2009).

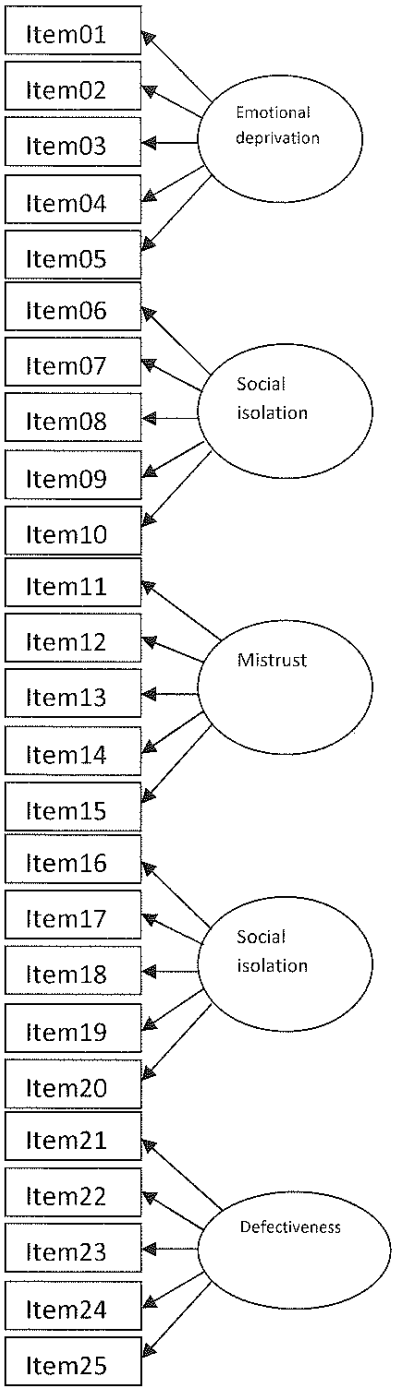

Figure 3.1a. Measurement model of schema domain of Disconnect and Rejection domain proposed by Young et al. (2003), consisting of five latent variables.

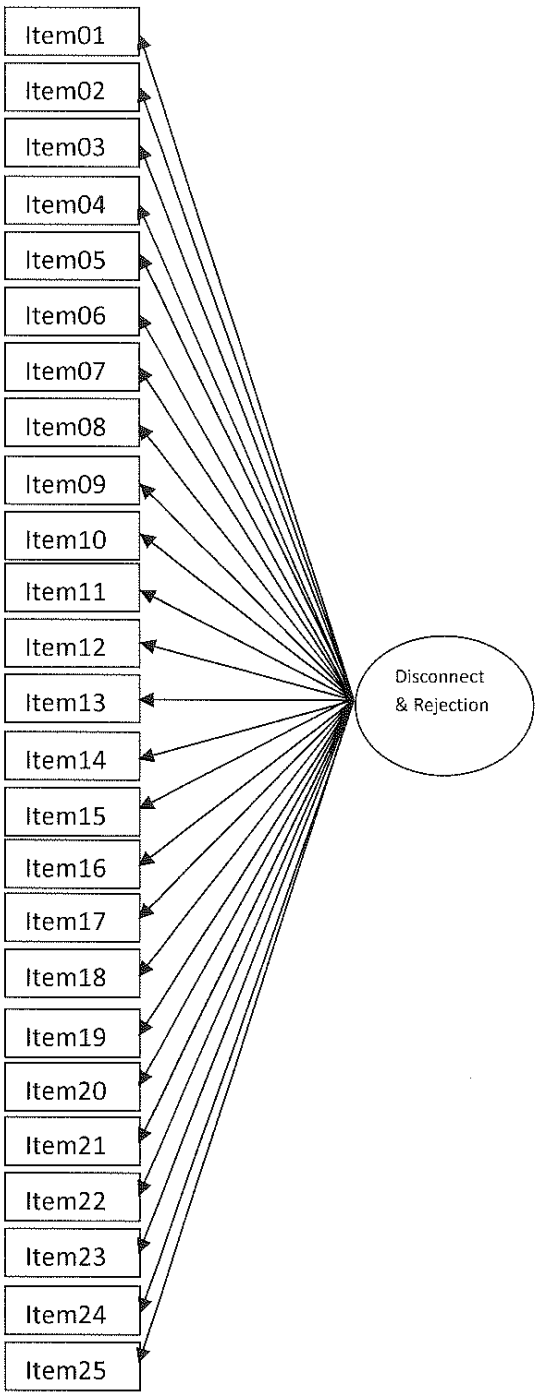

Figure 3.1b. One latent factor measurement model of Disconnect and Rejection domain.

The validation of structural relationship. The author tested the structural model of the relationship among EMSs, schema modes, and alcohol use. At the beginning, the author specified the structural model in accordance with the literature review. The EMSs were specified as exogenous variables influencing schema modes which were specified as mediating variables. The literature review indicated that individual with different EMSs tend to utilize different schema modes. Then, schema modes were specified to have effects on alcohol use.

Subsequently, the structural model was tested. The free parameters of the model were estimated. Moreover, several statistic values indicating the model fit were calculated. These model fit indices represented how well the structural model hypothesized by the author was congruence with the actual covariance matrices from empirical data. The fundamental fit index is Chi-square (χ^2) goodness of fit. The statistical insignificance of χ^2 indicates that good fit between actual covariance matrices and estimated covariance metrics from hypothesized model. However, χ^2 is sensitive for sample size. It will almost certainly be significant in the case of large sample study (Kline, 2011; MacKinnon, 2008; Schumacker & Lomax, 2010). Other fit indices are recommended, such as $\chi^2_{/df}$, comparative fit index (CFI), Root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). The $\chi^2_{/df}$ is the method to reduce the sensitivity to sample size by divided $\chi^2$by the degrees of freedom. Nonetheless, there is no universal agreed upon the acceptable criterion, which are varies across statisticians from less than 2.0 to less than 5.0 (Schumacker & Lomax, 2010). Other fit indices that have consistent agreement between researchers and less sensitive to sample size were considered for the current study. The CFI more than .90, RMSEA less than .08, and SRMR values less than .08 are considered a good fit of a model (Hair et al., 2010; Kline, 2011; MacKinnon, 2008; Schumacker & Lomax, 2010).

If the model fit indices showed that hypothesized model not fit with the data. The author decided to modify the model. The model modification was based on theoretical consideration and modification indices. All statistical analyses were performed by SPSS 15.0 and Mplus 7.3.

CHAPTER IV
RESEULTS

The objectives of this study were to develop and examine the structural relationship between early maladaptive schemas, schema modes, and alcohol use among college students. The author adopted structural equation modeling framework to analyze the structural relationship. The results of this study are presented in 3 parts as follow;

Part 1 Demographic data and drinking behaviors of the sample

Part 2 Descriptive statistics of early maladaptive schemas, schema modes, and alcohol use

Part 3 Development and validation of structural model of the relationship between early maladaptive schemas, schema modes, and alcohol use among college students

For mutual understanding, listed below is the statistical and variable name abbreviations used in this chapter.

Statistical symbols and abbreviations used in this chapter

M	refers to	sample mean
SD	refers to	standard deviation of a sample
Min	refers to	minimum value in the data set
Max	refers to	maximum value in the data set
Sk	refers to	skewness
Ku	refers to	kurtosis
SE	refers to	standard error
p	refers to	probability value
t	refers to	t-test statistic
df	refers to	degrees of freedom
Δdf	refers to	degrees of freedom difference

r	refers to	Pearson product-moment correlation coefficient
λ	refers to	standardized factor loading
TE	refers to	total effect
DE	refers to	direct effect
IE	refers to	indirect effect
χ^2	refers to	chi-square
$\Delta\chi^2$	refers to	chi-square difference
χ^2_{rel}	refers to	relative chi-square
CFI	refers to	comparative fit index
ΔCFI	refers to	comparative fit index difference
RMSEA	refers to	root mean square error of approximation
SRMR	refers to	standardized root mean squared residual
R^2	refers to	coefficient of determination

Variable name abbreviations used in this chapter

EMS	refers to	early maladaptive schema
ABAN	refers to	Abandonment
MIST	refers to	Mistrust
EMODEP	refers to	Emotional Deprivation
DEFECT	refers to	Defectiveness
SOCISO	refers to	Social Isolation
DEPEND	refers to	Dependence
HARM	refers to	Vulnerability to Harm
ENMESH	refers to	Enmeshment
FAILURE	refers to	Failure
ENTITLE	refers to	Entitlement
INSUFFI	refers to	Insufficient Self-Control
SUBJUG	refers to	Subjugation
SELFSAC	refers to	Self-Sacrifice
APPROVAL	refers to	Approval Seeking

PESSIM	refers to	Pessimism
EMOIN	refers to	Emotional Inhibition
UNRELENT	refers to	Unrelenting Standards
PUNITIVE	refers to	Punitiveness
REJECT	refers to	Disconnection and Rejection domain
IMP_AUTO	refers to	Impaired Autonomy and Performance domain
IMP_LIMIT	refers to	Impaired Limits domain
OTH_DI	refers to	Other Directedness domain
OVER_VIG	refers to	Over-Vigilance and Inhibition domain
MODE	refers to	schema mode
VULNER	refers to	Vulnerable Child
ANGRY	refers to	Angry Child
ENRAGED	refers to	Enraged Child
IMPULSE	refers to	Impulsive Child
UNDIS	refers to	Undisciplined Child
SURREND	refers to	Compliant Surrender
DPROTECT	refers to	Detached Protector
DSOOTHER	refers to	Detached Self-Soother
AGGRAND	refers to	Self-Aggrandizer
BULLY	refers to	Bully and Attack
PUNI_PAR	refers to	Punitive Parent
DEMAND	refers to	Demanding Parent
HEALTHY	refers to	Healthy Adult
HAPPY	refers to	Happy Child
CHILD	refers to	Child modes
COPING	refers to	Maladaptive Coping modes
PARENT	refers to	Dysfunctional Parent modes
ADAPTIVE	refers to	Adaptive modes
FREQ	refers to	frequency of alcohol use

QUAN	refers to	quantity of alcohol use
BINGE	refers to	binge drinking
ALUSE	refers to	alcohol use

Part 1 Demographic data and drinking behaviors of the sample

The sample of this study was 973 undergraduate students in Chiang Mai. The demographic data included age, sex, faculty group, years of study, grade point average, residence, monthly allowance. The drinking behaviors involved prevalence of past-year drinking, alcoholic beverage preferred, drinking partners, location where the most of the drinking took place, drinking occasions, frequency of drinking, quantity of drinking, binge drinking. All of these data are present in Table 4.1 and Table 4.2.

Table 4.1 Frequency and percentage of demographic data of the sample

Demographic data	**Frequency**	**Percentage**
Sex		
Male	394	40.5
Female	578	59.5
Total	**972**	**100.0**
Age		
18 years and younger	169	17.4
19 years	292	30.1
20 years	181	18.6
21 years	196	20.2
22 years	93	9.6
23 years and older	40	4.1
Total	**971**	**100.0**
($\bar{x}$ = 19.89, SD = 1.475)		

Table 4.1 Frequency and percentage of demographic data of the sample (cont.)

Demographic data	Frequency	Percentage
Year of study		
First year	372	38.4
Second year	197	20.3
Third year	268	27.6
Fourth year or higher	133	13.7
Total	**970**	**100.0**
Faculty group		
Social sciences and Humanities	559	57.5
Natural Sciences	283	29.1
Health Sciences	131	13.5
Total	**973**	**100.0**
Grade Point Average		
Below 2.00	14	1.4
2.00 to 2.49	117	12.0
2.50 to 2.99	238	24.5
3.00 to 3.49	355	36.5
3.50 and above	248	25.5
Total	**972**	**100.0**
Residence		
Home with parents	148	15.2
University dormitory	289	29.7
Dormitory with relatives	44	4.5
Dormitory outside university – stay alone	254	26.1
Dormitory outside university – with friends	237	24.4
Total	**972**	**100.0**

Table 4.1 Frequency and percentage of demographic data of the sample (cont.)

Demographic data	Frequency	Percentage
Monthly allowance		
5,000 baht or less	333	34.3
5,001 – 8,000 baht	435	44.8
8,001 – 10,000 baht	126	13.0
10,001 baht or more	76	7.8
Total	**970**	**100.0**

From the Table 4.1, a total of 973 undergraduate students participated in the study, dividing into 578 females (59.5%) and 394 males (40.5%). The mean age was 19.89 ± 1.475 years. Most of them were studying in first year (38.4%) and third year (27.6%), in Social Sciences and Humanities faculty group (57.5%). Their GPAs were most at 3.00 to 3.49 (36.5%), 3.50 and above (25.5%), and 2.50 to 2.99 (24.5). The distribution of residence was relatively close between university dormitories, dormitories outside university alone, and dormitories outside university with friends (29.7%, 26.1%, and 24.4% respectively). Most of them had monthly allowance around 5,001 to 8,000 baht (44.8%).

Table 4.2 Frequency and percentage of drinking behaviors of the sample

Drinking behaviors	Frequency	Percentage
Prevalence of past-year drinking		
Had drunk at least once	646	66.4
Had not drunk	327	33.6
Total	**973**	**100.0**
Alcoholic beverage preferred (more than 1 possible) (n = 646)		
Beer	612	94.7
Wine cooler, Bacardi, vodka	547	86.7
Cocktail frozen	546	84.5
Local liqueur	493	76.3
Whisky, brandy, other spirits	571	88.4

Table 4.2 Frequency and percentage of drinking behaviors of the sample (cont.)

Drinking behaviors	Frequency	Percentage
Drinking occasions (more than 1 possible) (n = 646)		
Weekends	534	82.7
Holidays (such as Songkran, Loy Krathong)	561	86.8
When stressed and upset	535	82.8
Sociability	608	94.1
After finishing an exam or sending a paper	534	82.7
While watching sport	495	76.6
Drinking partners (more than 1 possible) (n = 646)		
Alone	448	75.5
Friends (4 persons or less)	581	89.9
Friends (5 persons or more)	589	91.2
With the intimacy partner	484	74.9
With the relatives or family members	499	77.2
Location where the drinking took place (more than 1 possible) (n = 646)		
Dormitory	478	74.0
In campus	384	59.4
Restaurant, bar	591	91.5
Pub, discotheque, nightclub	519	80.3
Frequency of drinking in 30 days		
Less than once a month	199	30.8
1-2 time(s) a month	255	39.5
3-4 times a month	78	12.1
1-2 time(s) a week	72	11.1
3-4 times a week	23	3.6
5 times a week or more	19	2.9
Total	**646**	**100.0**

Table 4.2 Frequency and percentage of drinking behaviors of the sample (cont.)

Drinking behaviors	**Frequency**	**Percentage**
Quantity of drinking per occasion (standard drink)		
1-2 standard drink(s)	160	24.8
3-4 standard drinks	108	16.7
5-6 standard drinks	105	16.3
7-9 standard drinks	84	13.0
10-13 standard drinks	62	9.6
14 standard drinks or more	127	19.7
Total	**646**	**10.0**
Binge drinking		
None	209	32.4
1-2 time(s)	237	36.7
3-4 times	96	14.9
5-6 times	28	4.3
7-8 times	24	3.7
9-10 times	17	2.6
11-14 times	13	2.0
15 times or more	22	3.4
Total	**646**	**100.0**

From the table, 646 participants (66.4%) had drunk alcohol at least once in the past year. Among those who had drunk, they reported that beer was a drink of choice (94.7%), the most common drinking occasion was to socialize with friends (94.1%). They usually drank with their friends (89.9% with small group not more than 4 persons and 91.2 with large group 5 persons or more). The location where the most of the drinking took place was restaurant and bar (91.5%). Most of them drank 2 times or less a month (less than 1 time for 24.8% and 1 – 2 time(s) for 39.5, totaling 70.3%), and drank 1 – 2 standard drink(s) per occasion (24.8%). It was remarkable that 19.7% of them usually drank 14 standard drinks or more per occasion. For binge drinking, it was found that 69.1% of them engaged in binge drinking 2 times or less (32.4% for none, 36.7% for 1-2 times).

Part 2 Descriptive statistics of early maladaptive schemas, schema modes, and alcohol use

The descriptive statistics of early maladaptive schemas, schema modes, and alcohol use were calculated, which are presented at Table 4.3 to Table 4.5.

Table 4.3 Means, standard deviations, minimum and maximum values, kurtosis, skewness of early maladaptive schemas

EMS	M	SD	Min	Max	Sk	Ku
REJECT						
EMODEP	2.41	.99	1.00	5.60	.65	-.14
ABAN	2.58	1.05	1.00	6.00	.52	-.06
MIST	2.47	.88	1.00	6.00	.50	.07
SOCISO	2.06	.94	1.00	6.00	1.27	1.58*
DEFECT	1.91	.84	1.00	6.00	1.31	2.27*
IMP_AUTO						
FAILURE	2.44	.96	1.00	5.60	.46	-.35
DEPEND	1.94	.70	1.00	5.00	.77	.30
HARM	2.26	.90	1.00	6.00	.72	.24
ENMESH	2.32	.85	1.00	6.00	.55	.44
IMP_LIM						
ENTITLE	2.82	.84	1.00	5.80	.18	-.23
INSUFFI	2.66	.85	1.20	6.00	.30	-.25
OTH_DI						
SUBJU	2.49	.85	1.00	5.20	.49	.10
SELFSAC	3.58	.81	1.00	5.20	.05	.01
RECOG	3.30	.99	1.00	6.00	-.01	-.17
OVER_VIG						
EMOIN	2.67	.93	1.00	6.00	.47	.16
UNRELENT	3.54	.88	1.00	6.00	-.09	.01
PESSIM	3.36	.96	1.00	6.00	.04	-.29
PUNITIVE	3.77	.83	1.20	5.80	-.31	.10

From Table 4.3, the mean scores of EMSs ranged between 1.91 and 3.77. The mean score was highest for Punitiveness (PUNITIVE) (M = 3.77, SD = .83), followed by Self-Sacrifice (SELFSAC) and Unrelenting Standards (UNRELENT) (M = 3.58, SD = .81; and M = 1.94, SD = .70 respectively). The mean score of Defectiveness (DEFECT) was rated lowest 1.91, SD = .84). The mean score of Dependence (DEPEND) was the second (M = 1.94, SD = .70). The kurtosis values of EMSs ranged from -.31 to 1.31, which fell into ±1.5, indicating acceptable range for normal distribution (Tabachnick & Fidell, 2014). The kurtosis values of EMSs ranged between -.35 and 2.27. Most of them fell into ±1.5, which indicated acceptable range for normal distribution (Tabachnick & Fidell, 2014). With the exception, the kurtosis values of Isolation (SOCISO) and Defectiveness (DEFECT) were 1.58 and 2.27 respectively. The results suggesting that the distributions of these two EMSs were gathering in center.

Table 4.4 Means, standard deviations, minimum and maximum values, kurtosis, skewness of schema mode

Mode	M	SD	Min	Max	Sk	Ku
CHILD						
VULNER	2.34	.75	1.00	5.70	1.09	1.72
ANGRY	2.40	.69	1.00	5.00	.65	.92
ENRAGED	1.64	.64	1.00	5.00	1.58*	3.26*
IMPULSE	2.23	.65	1.00	5.38	.78	1.13
UNDIS	2.80	.76	1.00	5.40	.30	-.12
COPING						
SURREND	3.03	.74	1.00	5.86	.45	.39
DPROTECT	2.25	.74	1.00	5.56	.81	.89
DSOOTHER	2.94	.82	1.00	5.75	.40	.23
AGGRAND	2.66	.63	1.00	4.70	.45	.357
BULLY	2.20	.66	1.00	4.78	.53	.10
PARENT						
PUNI_PAR	2.38	.59	1.00	5.60	1.00	1.91*
DEMAND	3.10	.75	1.00	5.29	.06	-.03
ADAPTIVE						
HAPPY	3.94	.79	1.50	6.00	-.19	-.12
HEALTHY	3.99	.78	1.40	5.90	-.34	.03

From Table 4.4, the mean scores of schema modes ranged from 1.64 to 3.99. The mean score was highest for Healthy Adult (HEALHTY) (M = 3.99, SD = .78), closely followed by Happy Child (HAPPY) (M = 3.94, SD = .79). The mean score of Enraged Child (ENRAGED) was the lowest (M = 1.64, SD= .64). The kurtosis values of schema mode ranged between -.34 and 1.58. Most of them fell into ±1.5, indicating acceptable range for normal distribution (Tabachnick & Fidell, 2014). Only Enraged Child scored 1.58. The kurtosis values of schema modes ranged between -.12 and 3.26. Most of them fell into ±1.5, which indicated acceptable range for normal distribution (Tabachnick & Fidell, 2014). With the exception, the kurtosis values of Enraged Child and Punitive Parent (PUNI_PAR) were 3.26 and 1.91 respectively. These results suggested that the scores of Enraged Child clustered on the low values and grouped together. For Punitive Parent, the scores were peak at the center.

Table 4.5 Means, standard deviations, minimum and maximum values, kurtosis, skewness of alcohol use

ALUSE	M	SD	Min	Max	Sk	Ku
FREQ	1.62	1.758	0	9	1.439	2.106
QUAN	2.66	3.018	0	9	1.002	-.272
BINGE	1.65	1.874	0	9	1.874	4.104

From the Table 4.5, the mean scores of alcohol use ranged between 1.62 and 2.66. The skewness and kurtosis values of binge drinking (BINGE) were 1.874 and 4.104 respectively. It suggested that the scores of binge drinking clustered on the low values and grouped together. For frequency of alcohol use (FREQ), the kurtosis values was 2.106, indicating the scores were peak in the center.

According to Table 4.3 to Table 4.5, most of the variables in this study were normally distributed. It would be appropriate for applying structure equation modeling techniques. Nonetheless, in order to produce more accurate parameter estimation, the author performed mean- and variance adjusted maximum likelihood (MLMV) estimation. The MLMV estimation is robust to non-normality than maximum likelihood estimation (Asparouhov, Muthen, & Muthen, 2005).

Table 4.6 Correlation matrix displaying the correlation coefficients among EMSs, schema modes, and alcohol use.

		1	2	3	4	5	6	7	8	9	10
EMS											
1	EMODEP	1									
2	ABAN	.472**	1								
3	MIST	.559**	.505**	1							
4	SOCISO	.625**	.431**	.610**	1						
5	DEFECT	.639**	.468**	.608**	.771**	1					
6	FAILURE	.463**	.302**	.399**	.479**	.575**	1				
7	DEPEND	.422**	.393**	.422**	.532**	.590**	.631**	1			
8	HARM	.423**	.455**	.515**	.433**	.439**	.440**	.523**	1		
9	ENMESH	.304**	.343**	.362**	.360**	.357**	.323**	.413**	.403**	1	
10	SUBJU	.477**	.460**	.465**	.554**	.566**	.526**	.592**	.459**	.499*	1
11	SELFSAC	.171**	.216**	.134**	.121**	.100**	.104**	.014	.123**	.204*	.228**
12	EMOIN	.461**	.291**	.379**	.441**	.459**	.335**	.363**	.307**	.280*	.503**
13	UNRELENT	.364**	.319**	.345**	.371**	.337**	.289**	.314**	.350**	.377*	.386**
14	ENTITLE	.358**	.387**	.474**	.425**	.375**	.201**	.309**	.394**	.391*	.350**
15	INSUFFI	.398**	.425**	.408**	.467**	.466**	.473**	.505**	.455**	.370*	.509**
16	RECOG	.215**	.395**	.298**	.211**	.205**	.119**	.167**	.303**	.322*	.288**
17	PESSIM	.486**	.473**	.520**	.436**	.435**	.433**	.403**	.582**	.369*	.495**
18	PUNITIVE	.230**	.273**	.266**	.203**	.168**	.179**	.164**	.272**	.268*	.271**
MODE											
19	VULNER	.545**	.473**	.495**	.581**	.625**	.502**	.500**	.449**	.296*	.499**
20	ANGRY	.361**	.406**	.518**	.423**	.445**	.273**	.312**	.443**	.329*	.373**
21	ENRAGED	.178**	.251**	.311**	.286**	.321**	.183**	.308**	.336**	.231*	.231**
22	IMPULSE	.266**	.367**	.380**	.336**	.377**	.311**	.409**	.427**	.316*	.356**
23	UNDIS	.287**	.339**	.311**	.353**	.322**	.324**	.354**	.404**	.273*	.360**
24	HAPPY	-.323**	-.085**	-.307**	-.340**	-.400**	-.235**	-.289**	-.206**	-.049	-.122**
25	SURREND	.298**	.304**	.255**	.378**	.365**	.275**	.301**	.242**	.255**	.486**
26	DPROTECT	.468**	.303**	.445**	.562**	.531**	.355**	.416**	.371**	.252**	.422**
27	DSOOTHER	.268**	.300**	.286**	.303**	.312**	.165**	.151**	.266**	.148**	.247**
28	AGGRAND	.221**	.344**	.316**	.290**	.279**	.120**	.229**	.345**	.285**	.250**
29	BULLY	.324**	.272**	.430**	.363**	.365**	.209**	.256**	.330**	.281**	.290**
30	PUNI_PAR	.391**	.366**	.467**	.460**	.536**	.396**	.465**	.407**	.310**	.423**
31	DEMAND	.288**	.247**	.320**	.259**	.237**	.067*	.127**	.259**	.278**	.251**
32	HEALTHY	-.070*	-.081*	-.094**	-.092**	-.188**	-.223**	-.298**	-.110**	-.025	-.096**
ALUSE											
33	FREQ	.041	.008	.026	-.040	.021	.029	.026	.052	.017	-.066*
34	QUAN	.063*	-.014	.011	.014	.061	.013	.025	.001	-.049	-.072*
35	BINGE	.071*	-.015	.006	-.002	.078*	.016	.031	-.023	-.003	-.089**

*p<.05 , **p<.01

Table 4.6 Correlation matrix displaying the correlation coefficients among EMSs, schema modes, and alcohol use (cont.).

		11	12	13	14	15	16	17	18	19	20
EMS											
1	EMODEP										
2	ABAN										
3	MIST										
4	SOCISO										
5	DEFECT										
6	FAILURE										
7	DEPEND										
8	HARM										
9	ENMESH										
10	SUBJU										
11	SELFSAC	1									
12	EMOIN	.238**	1								
13	UNRELENT	.357**	.350**	1							
14	ENTITLE	.161**	.262**	.381**	1						
15	INSUFFI	.128**	.346**	.337**	.490**	1					
16	RECOG	.308**	.209**	.350**	.446**	.377**	1				
17	PESSIM	.281**	.330**	.498**	.420**	.509**	.418**	1			
18	PUNITIVE	.392**	.181**	.436**	.320**	.288**	.471**	.559**	1		
MODE											
19	VULNER	.094**	.327**	.329**	.263**	.403**	.189**	.483**	.196**	1	
20	ANGRY	.155**	.233**	.369**	.453**	.391**	.348**	.489**	.321**	.510**	1
21	ENRAGED	-.037	.034	.192**	.339**	.318**	.175**	.300**	.134**	.374**	.536**
22	IMPULSE	.022	.104**	.268**	.431**	.489**	.274**	.393**	.216**	.457**	.587**
23	UNDIS	.063	.248**	.273**	.395**	.609**	.271**	.418**	.209**	.424**	.466**
24	HAPPY	.252**	-.159**	-.018	-.081*	-.142**	.139**	-.107**	.164**	-.294**	-.127**
25	SURREND	.345**	.327**	.342**	.196**	.270**	.205**	.375**	.299**	.420**	.331**
26	DPROTECT	.054	.381**	.278**	.322**	.377**	.126**	.392**	.147**	.603**	.463**
27	DSOOTHER	.228**	.255**	.223**	.293**	.228**	.234**	.342**	.183**	.358**	.395**
28	AGGRAND	.116**	.149**	.298**	.574**	.387**	.469**	.346**	.246**	.325**	.560**
29	BULLY	.108**	.265**	.316**	.466**	.299**	.342**	.388**	.242**	.342**	.582**
30	PUNI_PAR	.083**	.297**	.300**	.304**	.410**	.146**	.477**	.255**	.614**	.472**
31	DEMAND	.302**	.238**	.474**	.310**	.116**	.328**	.373**	.423**	.325**	.394**
32	HEALTHY	.281**	-.026	.102**	.027	-.166**	.090**	.024	.259**	-.144**	.034
ALUSE											
33	FREQ	.011	.010	-.086**	.111**	.073*	.057	.093**	.056	.021	.082*
34	QUAN	.074*	.035	-.028	.141**	.072*	.013	.074*	.020	.008	.041
35	BINGE	-.002	.051	-.065*	.140**	.085**	.036	.044	.014	.018	.023

*p<.05 , **p<.01

Table 4.6 Correlation matrix displaying the correlation coefficients among EMSs, schema modes, and alcohol use (cont.).

		21	22	23	24	25	26	27	28	29	30
EMS											
1	EMODEP										
2	ABAN										
3	MIST										
4	SOCISO										
5	DEFECT										
6	FAILURE										
7	DEPEND										
8	HARM										
9	ENMESH										
10	SUBJU										
11	SELFSAC										
12	EMOIN										
13	UNRELENT										
14	ENTITLE										
15	INSUFFI										
16	RECOG										
17	PESSIM										
18	PUNITIVE										
MODE											
19	VULNER										
20	ANGRY										
21	ENRAGED	1									
22	IMPULSE	.651**	1								
23	UNDIS	.386**	.532**	1							
24	HAPPY	-.273**	-.175**	-.056	1						
25	SURREND	.139**	.251**	.265**	.133**	1					
26	DPROTECT	.323**	.406**	.448**	-.273**	.363**	1				
27	DSOOTHER	.263**	.296**	.298**	.016	.321**	.387**	1			
28	AGGRAND	.438**	.519**	.438**	.104**	.320**	.358**	.342**	1		
29	BULLY	.425**	.422**	.350**	-.054	.320**	.462**	.393**	.612**	1	
30	PUNI_PAR	.614**	.508**	.413**	-.268**	.387**	.547**	.379**	.337**	.436**	1
31	DEMAND	.171**	.267**	.200**	.146**	.447**	.300**	.333**	.415**	.394**	.348**
32	HEALTHY	-.245**	-.227**	-.085**	.569**	.200**	-.058	.111**	.091**	.103**	-.175**
ALUSE											
33	FREQ	.222**	.171**	.081*	-.093**	-.045	.005	.061	.136**	.106**	.100**
34	QUAN	.119**	.091**	.082*	-.067*	-.051	.051	.103**	.118**	.109**	.069*
35	BINGE	.158**	.080*	.042	-.117**	-.057	.015	.071*	.120**	.085**	.102**

*p<.05 , **p<.01

Table 4.6 Correlation matrix displaying the correlation coefficients among EMSs, schema modes, and alcohol use (cont.).

		31	32	33	34	35
EMS						
1	EMODEP					
2	ABAN					
3	MIST					
4	SOCISO					
5	DEFECT					
6	FAILURE					
7	DEPEND					
8	HARM					
9	ENMESH					
10	SUBJU					
11	SELFSAC					
12	EMOIN					
13	UNRELENT					
14	ENTITLE					
15	INSUFFI					
16	RECOG					
17	PESSIM					
18	PUNITIVE					
MODE						
19	VULNER					
20	ANGRY					
21	ENRAGED					
22	IMPULSE					
23	UNDIS					
24	HAPPY					
25	SURREND					
26	DPROTECT					
27	DSOOTHER					
28	AGGRAND					
29	BULLY					
30	PUNI_PAR					
31	DEMAND	1				
32	HEALTHY	.296**	1			
ALUSE						
33	FREQ	-.008	-.096**	1		
34	QUAN	.018	-.053	.678**	1	
35	BINGE	.006	-.109**	.742**	.717**	1

*p<.05 , **p<.01

From Table 4.6, the correlation among EMSs, schema modes and alcohol use are provided in order to examine potential problems due to multicolinearity.

The correlation matrix shows that intercorrelation of EMSs ranged between .014 and .771. The highest coefficient was between Defectiveness (DEFECT) and Social Isolation (SOCISO) ($r = .711$, $p<.01$); the next highest was between Emotional Deprivation (EMODEP) and Defectiveness ($r = .639$, $p<.01$).

From the table, the intercorrelation of schema modes ranged from -.294 to .651. The highest correlation was between Impulsive Child and Enraged Child ($r = .651$, $p<.01$); the second highest was between Punitive Parent (PUNI_PAR) and Vulnerable Child (VULNER) ($r = .614$, $p<.01$).

The intercorrealtion of alcohol use ranged between .687 and .742. The highest correlation was between quantity of alcohol use (QUAN) and binge drinking (BINGE) ($r = .742$, $p<.01$).

When considering the relationship between EMSs and schema modes, it was found that the correlation coefficients varied from -.400 to .625. The highest correlation was between Vulnerable Child and Defectiveness ($r = .625$, $p<.01$); the next highest was between Undisciplined Child (UNDIS) and Insufficient Self-Control (INSUFFI) ($r = .609$, $p<.010$).

As describe above, there were no correlation which was higher than .85. Therefore, it can be conclude that there was the absence of multicolinearity problems (Kline, 2011; Tabachnick & Fidell, 2014).

Part 3 Development and validation of structural model of the relationship among early maladaptive schemas, schema modes, and alcohol use among college students

The author examined the structural relationship between EMSs and alcohol use with considering the role of schema modes as mediating factors. Structural equation modeling framework using two-step modeling procedures proposed by Anderson and Gerbing (1988) was applied. In the first step, a series of confirmatory factor analyses were performed in order to investigate the appropriate measurement model of EMSs and

schema modes. In the second step, based-on measurement model from the first step, the structural model of relationship among EMSs, schema modes, and alcohol use was developed and validated. The results of these analyses are present in 2 parts

3.1 The validation of measurement model of early maladaptive schemas and schema modes

3.2 The validation of structural relationship among early maladaptive schemas, schema modes, and alcohol use.

3.1 The validation of measurement model of early maladaptive schemas and schema modes

For validating the measurement model of EMSs and schema modes, a series of confirmatory factor analysis were employed. Due to the highly complexity of the models: for EMSs, there were 90 items for 18 EMSs which could be categorized into 5 schema domain; for schema modes, there were 114 items for 14 modes which could be grouped into 4 types of schema modes. The author preferred to use incremental approach to the analyses.

First, the author independently examined unifactorial models to validate the convergent validity of items belonging to each latent variable.

Second, the author brought each unifactorial model in their respective schema domain and the main type of schema modes for discriminant validation. The good discriminant validity of each item was suggested by the absence of cross factor-loading on other latent variable. Furthermore, the good discriminant validity of EMSs and schema modes was indicated by the finding that hypothesized model had better model fit indices than one-factor model.

Third, the author examined the second-order model of EMSs, which could be called schema domains and types of schema modes. The author parceled individual items into their represented EMS or schema mode. The item parceling approach was conducted for reducing the bias due to non-normal distribution and increasing the stability of parameter estimation in a highly complex model (Kline, 2011; Little, Cunningham, & Shahar, 2002; Matsunaga, 2008). For EMSs, the author tested the factor structures of EMSs and schema modes proposed by Young et al. (2003). In addition, previous research documented the alternative second-order model of EMSs. In order to reduce

confirmatory bias, the author compared Young's theoretical model with alternative mode: one second-order model, Calvete, Orue, and González-Diez (2012)'s 3-factor model, Saritaş and Gençöz (2011)'s 3-factor mode, and Soygüt, Karaosmanoğlu, and Çakir (2009)'s 5 factor model. The findings are presented below.

3.1.1 The validation of measurement model of early maladaptive schemas

In the first step, the convergent validity of each EMS was separately examined. The findings are presented in Table 4.7.

Table 4.7 Fit indices and factor loadings for the confirmatory factor analysis of unifactorial EMS model

EMS	χ^2	df	χ^2/df	RMSEA (90% CI)	CFI	SRMR	λ		
							min	max	average
REJECT									
EMODEP	27.685	5	5.537	.068 (.045 - .094)	.974	.027	.528	.714	.633
EMODEP-modified[a]	7.652	4	1.913	.031 (.000 - .063)	.996	.014	.558	.669	.622
ABAN	16.912	5	3.382	.049 (.025 – .076)	.988	.019	.460	.803	.630
MIST	6.990	5	1.398	.020 (.000 - .052)	.997	.015	.323	.711	.566
SOCISO	15.882	5	3.176	.047 (.022 - .074)	.988	.020	.526	.764	.668
DEFECT	17.084	5	3.417	.050 (.025 - .077)	.981	.024	.597	.715	.646
IMP_AUTO									
FAILURE	24.848	5	4.970	.064 (.040 - .090)	.980	.026	.521	.787	.657
DEPEND	12.892	5	2.578	.040 (.013 - .068)	.978	.023	.352	.719	.495
HARM	9.553	5	1.911	.031 (.000 - .060)	.983	.018	.310	.609	.437
ENMESH	21.283	5	4.257	.058 (.036 - .082)	.908	.048	.161	.707	.387
IMP_LIM									
ENTITLE	22.954	5	4.591	.061 (.037 -.087)	.953	.030	.349	.602	.485
INSUFFI	23.436	5	4.687	.062 (.038 - .088)	.950	.031	.460	.560	.502
OTH_DI									
SUBJU	9.919	5	1.984	.032 (.000 - .061)	.987	.019	.352	.598	.501
SELFSAC	5.088	5	1.017	.004 (.000 - .045)	.999	.014	.424	.613	.468
RECOG	8.355	5	1.671	.026 (.000 - .056)	.995	.015	.518	.648	.568

Table 4.7 Fit indices and factor loadings for the confirmatory factor analysis of unifactorial EMS model (cont.)

EMS	χ^2	df	χ^2/df	RMSEA (90% CI)	CFI	SRMR	λ		
							min	max	average
OVER_VIG									
EMOIN	45.274	5	9.055	.091 (.068 - .116)	.901	.049	.158	.818	.441
EMOIN-modified[b]	7.385	4	1.846	.029 (.000 - .062)	.992	.017	.137	.838	.435
UNRELENT	12.861	5	2.572	.040 (.013 - .068)	.957	.024	.250	.545	.395
PESSIM	24.923	5	4.985	.064 (.040 - .090)	.967	.029	.484	.652	.554
PUNITIVE	32.084	5	6.417	.076 (.052 - .101)	.924	.036	.327	.581	.482
PUNITIVE-modified[c]	12.439	4	3.110	.047 (.019 - .077)	.977	.022	.347	.581	.466

[a] re-specified error covariance between the error terms of Item1 and Item19.

[b] re-specified error covariance between the error terms of Item66 and Item84.

[c] re-specified error covariance between the error terms of Item36 and Item34.

From Table 4.7, the findings indicated that the fifteenth out of 18 EMSs demonstrated an acceptable to good fit with empirical data, regarding χ^2_{df}< 5.0, RMSEA < .08, CFI ≥ .90, and SRMR < .08. With the exception, the results suggested the poor fit of Emotional Deprivation (EMODEP) (χ^2_{df}= 5.537, RMSEA = .068, CFI = .974, and SRMR = .027), Emotional Inhibition (EMOIN) (χ^2_{df}= 9.055, RMSEA = .091, CFI = .901, and SRMR = .049), and Punitiveness (PUNITIVE) (= 6.417, RMSEA = .076, CFI = .924, and SRMR = .036).

The authors respecified the models of these EMSs taking into account theoretical basis and modification indices. For Emotional Deprivation, the error term of Item 1 and Item 9 were set as covariance. After respecified, the model of Emotional Deprivation showed good fit (χ^2_{df}= 1.913, RMSEA = .031, CFI = .996, and SRMR = .014). For Emotional Inhibition, the error term of Item 66 and Item 84 were set as covariance. The respecification resulted the good fit of Emotional Inhibition model (χ^2_{df}= 1.846, RMSEA = .029, CFI = .992, and SRMR = .017). Finally, for Punitiveness, the author covaried the error term between item 36 and item 34. The modified model of Punitiveness showed good fit to data (χ^2_{df}= 3.110, RMSEA = .047, CFI = .977, and SRMR = .022).

When considering standardized factor loadings of each item, the author found that most of them valued higher than .32 (Tabachnick & Fidell, 2014). These results suggested that individual items of unifactorial subscales were the indicators of same construct, demonstrating the convergent validity of EMS level. However, it was found that the factor loadings of some items fell short of this criterion: Item 26 (Vulnerability of Harm) valued .310; Item 9 (Enmeshment: ENMESH) valued .161; Item 66 and Item 84 (Emotional Inhibition) valued .202 and .137 respectively; Item 49 (Unrelenting Standards: UNRELENT) valued .250. The author took these results into consideration for analyzing the data in the next step.

The next step was the discriminant validation of items and EMSs in their respective schema domain. The findings are presented in Table 4.8 to 4.12.

Table 4.8 Fit indices for the confirmatory factor analysis of models containing items and EMSs in Disconnect and Rejection domain

Model	χ^2	**df**	$\chi^2_{/df}$	**RMSEA (90% CI)**	**CFI**	**ΔCFI**	**SRMR**
One-factor model	1224.551	275	4.452	.060 (.056 - .063)	.808		.057
Five-factor model*	772.901	265	2.917	.044 (.041 - .048)	.897	.089	.046
Five-factor model-modified*	683.975	242	2.826	.043 (.040 - .047)	.908	.011	.039

* consisting of Abandonment, Mistrust, Emotional Deprivation, Defectiveness, Social Isolation

From Table 4.8, five-factor model of Disconnect and Rejection domain proposed by Young, Klosko, and Weishaar (2003) had better fit than one factor model (ΔCFI = .089). The finding suggested good discriminant validity of EMSs in this domain. However, the CFI of the five-factor model fell slightly from .90. The model respecification was performed based-on theoretical consideration as well as modification indices. Item 74 (Abandonment) was dropped from the model due to high cross-loading with other EMSs in this domain. The high cross loading indicated poor discriminant validity of the item. After dropping this item, the fit indices were improved. The fit indices of modified five-factor model of Disconnection and Rejection domain showed

good fit to the empirical data, χ^2 = 683.975, df = 242, $\chi^2_{/df}$= 2.826, RMSEA = .043, CFI = .908, and SRMR = .039. The items remaining in the model were supported for their good discriminant validity.

Table 4.9 Fit indices for the confirmatory factor analysis of models containing items and EMSs in Impaired Autonomy and Performance domain

Model	χ^2	**df**	$\chi^2_{/df}$	**RMSEA (90% CI)**	**CFI**	**ΔCFI**	**SRMR**
One-factor model	723.488	170	4.256	.058 (.054 - .062)	.785		.059
Four-factor model*	545.110	164	3.323	.049 (.044 - .053)	.852	.067	.052
Four-factor model-modified*	354.834	128	2.606	.043 (.037 - .048)	.909	.057	.042

* consisting of Dependence, Vulnerability to Harm, Enmeshment, and Failure

From Table 4.9, four-factor model of Impaired Autonomy and Performance domain proposed by Young et al. (2003) had better fit than one factor model (ΔCFI = .067). The finding suggested good discriminant validity of EMSs in this domain. However, the CFI of the five-factor model was .852, which fell from .90. The model respecification was performed based-on theoretical consideration as well as modification indices. Item 9 (Enmeshment) was deleted from the model because its factor loading was less than .32. Item 26 (Vulnerability to Harm) was deleted from the model due to high cross-loading with other EMSs in this domain and its factor loading which was less than .32 (λ=.308). After dropping these two items, the fit indices were improved, χ^2 = 397.437, df = 129, $\chi^2_{/df}$= 3.081, RMSEA = .046, CFI = .893, and SRMR = .047. The CFI, nonetheless, fell slightly from .90. The author continued modifying the model by allowing the error term between Item 27 and Item 63 (both Enmeshment) to covary. Through there, the modified four-factor model of Impaired Autonomy and Performance domain had a good fit, χ^2 = 354.834 df = 128, $\chi^2_{/df}$= 2.606, RMSEA = .043, CFI = .909 SRMR = .042. The items remaining in the model were supported for their good discriminant validity.

Table 4.10 Fit indices for the confirmatory factor analysis of models containing items and EMSs in Impaired Limits domain

Model	χ^2	df	$\chi^2_{/df}$	RMSEA (90% CI)	CFI	ΔCFI	SRMR
One-factor model	226.432	35	6.469	.075 (.066 - .084)	.807		.056
Two-factor model*	199.978	34	5.881	.071(.062 - .080)	.833	.026	.053
Two-factor model-modified*	124.668	31	4.022	.056 (.046 - .066)	.905	.072	.041

* consisting of Entitlement and Insufficient Self-Control

From Table 4.10, two-factor model of Impaired Limits domain proposed by Young et al. (2003) had better fit than one factor model (ΔCFI = .026). The results indicated good discriminant validity of EMSs in this domain. However, the CFI of the two-factor model was .833, which fell from .90. The author respecified the model regarding theoretical basis and empirical evidences such as modification indices. The three covariances of error term were set: Item 32 and Item 68 (both Entitlement), Item 37 and Item 87 (both Insufficient Self-Control), and Item 68 (Entitlement) and 69 (Insufficient Self-Control). As a result, the modified two-factor model demonstrated good fit (χ^2 = 154.668, df = 31, $\chi^2_{/df}$= 4.022, RMSEA = .056, CFI = .905 SRMR = .041). The items remaining in the model were supported for their good discriminant validity.

Table 4.11 Fit indices for the confirmatory factor analysis of models containing items and EMSs in Other-Directedness domain

Model	χ^2	df	$\chi^2_{/df}$	RMSEA (90% CI)	CFI	ΔCFI	SRMR
One-factor model	609.617	90	6.774	.077 (.071 - .083)	.703		.068
Three-factor model*	296.803	86	3.451	.050 (.044 - .056)	.879	.176	.049
Three-factor model-modified*	214.322	73	2.936	.045(.038 - .052)	.912	.033	.041

* consisting of Subjugation, Self-Sacrifice, Approval Seeking

From Table 4.11, three-factor model of Other-Directedness domain proposed by Young et al. (2003) had better fit than one factor model (ΔCFI = .176). The results indicated good discriminant validity of EMSs in this domain. However, the CFI of the three-factor model fell short of .90 (CFI = .879). The author respecified the model of this domain taking into account theoretical basis and modification indices. Item 47 (Self-Sacrifice) was drop due to poor discriminant validity suggested by cross-loading on other EMSs in this domain. After dropping this item, the fit indices were improved. The fit indices of modified three-factor model of Other-Directedness domain showed good fit to the empirical data (χ^2 = 214.322, df = 73, $\chi^2_{/df}$= 2.936, RMSEA = .045, CFI = .912, SRMR = .041). The items remaining in the model were supported for their good discriminant validity.

Table 4.12 Fit indices for the confirmatory factor analysis of models containing items and EMSs in Over-Vigilance and Inhibition domain

Model	χ^2	**df**	$\chi^2_{/df}$	**RMSEA (90% CI)**	**CFI**	**ΔCFI**	**SRMR**
One-factor model	894.793	170	5.263	.066 (.062 - .071)	.690		.065
Four-factor model*	718.164	164	4.379	.059 (.055 -.063)	.763	.073	.063
Four-factor model-modified*	266.843	83	3.215	.048 (.041 - .054)	.906	.143	.039

* consisting of Pessimism, Emotional Inhibition, Unrelenting Standards, and Punitiveness

From Table 4.12, four-factor model of Over-Vigilance and Inhibition domain proposed by Young et al. (2003) had better fit than one factor model (ΔCFI = .073). The results indicated good discriminant validity of EMSs in this domain. However, the CFI of the four-factor model was .763, which fell short of .90. The author respecified the model of this domain taking into account theoretical basis and modification indices. Item 49 (Unrelenting Standards), Item 66 (Emotional Inhibition), and Item 84 (Emotional Inhibition) were dropped from the model because of less than .32 of its factor loading. Furthermore, Item 13 (Unrelenting Standards) and Item 90 (Punitiveness) were deleted due to high cross-loading with other EMSs in this domain. As a result, the fit indices of

the model were improved (χ^2 = 289.849, df = 84, χ^2_{df}= 3.451, RMSEA = .050, CFI = .895, SRMR = .041), but were less than the acceptable values. The author then repecified the model by setting the covariance between the error of Item 18 and Item 72 (both Punitiveness). Consequently, the modified four-factor model demonstrated a good fit indices (χ^2 = 266.843, df = 83, χ^2_{df}= 3.215, RMSEA = .048, CFI = .906, SRMR = .039). The items remaining in the model were supported for their good discriminant validity.

After examining discriminant validity of items and EMSs, the author investigated the second-order model at the schema domain level. The author applied item parceling approach by averaging of individual items into their representative unifactorial EMSs. Subsequently, EMS scores derived from parceling were used in second-order confirmatory factor analysis.

Table 4.13 Standardized factor loadings, and standard errors of second-order model of early maladaptive schemas proposed by Young at el. (2003)

EMS	λ	SE	t	R^2
REJECT				
EMODEP	.746	.017	43.183	.577
ABAN	.595	.023	25.696	.354
MIST	.738	.019	38.741	.545
SOCISO	.844	.013	65.012	.712
DEFECT	.862	.011	77.960	.743
IMP_AUTO				
FAILURE	.707	.020	35.959	.500
DEPEND	.776	.016	48.845	.603
HARM	.686	.019	36.240	.470
ENMESH	.567	.024	23.968	.321
IMP_LIM				
ENTITLE	.635	.024	26.554	.403
INSUFFI	.772	.022	35.255	.596

Table 4.13 Standardized factor loadings, and standard errors of second-order model of early maladaptive schemas proposed by Young at el. (2003)

EMS	λ	SE	t	R^2
OTH_DI				
SUBJU	.473	.027	17.776	.502
SELFSAC	.299	.032	9.479	.089
RECOG	.708	.023	30.755	.224
OVER_VIG				
EMOIN	.642	.022	29.458	.412
UNRELENT	.798	.015	52.264	.637
PESSIM	.587	.024	24.598	.344
PUNITIVE	.522	.027	19.002	.273
Model fit : χ^2= 1129.702, df = 125, χ^2_{df}= 9.038 , RMSEA = .091(90% CI : .086 - .096), CFI = .831, SRMR = .074				

As represented in Table 4.13, the results indicated that the fit indices of Young's 5-factor second-order model were lower than acceptable fit (χ^2=1129.702, df = 125, χ^2/df =9.038, RMSEA =.091, CFI = .831, SRMR = .074). The factor loadings of EMSs on Disconnection and Reject (REJECT) domain ranged from .595 to .862. The factor loadings of EMSs on Impaired Autonomy and Performance (IMP_AUTO) domain valued between .567 and .776. The factor loadings of EMSs on Impaired Limits (IMP_LIM) domain were between .635 and .772. The factor loadings of EMSs on Other-Directedness (OTH_DI) domain ranged from .299 to .708; the factor loading of Self-Sacrifice was less than .32. The factor loadings of EMSs on Overvigilance and Inhibition (OVER_VIG) valued between .522 and .798.

As describe above, the results failed to support Young's 5-factor second-order model and the factor loading of Self-Sacrifice was less than acceptable criterion, indicating poor convergent validity. The author then tested the alternative second-order models proposed by other researchers (one second-order model, Calvete's 3 second-order model, Saritaş's 3 second-order model, and Soygut's 5 second-order model). The results are showed in Table 4.14.

Table 4.14 Fit indices for the confirmatory factor analysis of Young's second-order model and alternative second-order models

Second-order model	χ^2	**df**	$\chi^2_{/df}$	**RMSEA (90% CI)**	**CFI**	**SRMR**
Young's 5 second-order model	1129.702	125	9.038	.091(.086 - .096)	.831	.074
Alternative model						
One-second order model	1499.425	135	11.107	.102 (.097 - .107)	.770	.077
Saritaş (2008)'s 3 second-order model	1066.132	132	8.077	.085 (.081 - .090)	.843	.070
Calvete (2013)'s 3 second-order model	963.184	132	7.297	.080 (.076 - .085)	.860	.068
Soygut (2011)'s 5 second-order model	1049.263	125	8.394	.087 (.082 - .092)	.844	.066

From Table 4.14, the Calvete's 3 second-order model was considerably better than other alternative model (χ^2=963.184, df = 132, χ^2/df =7.297, RMSEA =.080, CFI = .831, SRMR = .074); nevertheless, all alternative models and Young's proposed model did not acceptable fit with the data. As mentioned earlier, the fit indices of $\chi^2_{/df}$ were higher than 5.0, RMSEA were higher than .08, CFI were less than .90, and SRMR were higher than .08. Therefore, the model modification was performed, based-on Young's proposed model, theoretical consideration, and modification index.

At the beginning, the results of confirmatory factor analysis on Young's proposed model indicated the problem of the latent variable covariance matrix (PSI) was not positive definite, which might occur due to model specification. The author reconsidered the model specification and estimated parameters from the analysis. The findings showed very strong positive correlation between Other-Directedness domain and Overvigilance and Inhibition domain (r = .944). Considering the content of these two domains and the results from previous studies, the author found that it would be possible to combine these two latent variables together. This new latent variable was named Exaggerated Standards (EXG_STD), which was characterized by over-concern about social values and standards, emphasis on perfection, performance, responsibility, and acceptance.

In addition, taking modification indices and previous studies into consideration, the author decided to move Emotion Inhibition to Disconnection and Rejection domain, and move Subjugation to Impaired Autonomy domain. After the respecification, it was found that the fit indices of the four-second order model was better (χ^2=934.437, df = 129, χ^2/df =7.247, RMSEA =.080, CFI = .864, SRMR = .066). The author further modified the model by allowing the error terms between some EMS to covary, namely;

- Dependence and Failure
- Subjugation and Vulnerability to Harm
- Failure and Dependence
- Pessimism and Vulnerability to Harm
- Emotional Inhibition and Subjugation
- Entitlement and Approval Seeking

The results of model respecifiation are presented in Table 4.15.

Table 4.15 Standardized factor loadings, and standard errors of modified four second-order model of early maladaptive schemas

EMS	λ	**se**	**t**	$\mathbf{R^2}$
REJECT				
EMODEP	.754	.016	46.375	.569
ABAN	.630	.022	28.824	.397
MIST	.757	.019	39.296	.572
SOCISO	.791	.016	48.812	.625
DEFECT	.804	.015	52.774	.646
EMOIN	.556	.026	21.395	.309
IMP_AUTO				
FAILURE	.641	.023	27.651	.411
DEPEND	.726	.018	40.608	.528
HARM	.697	.020	34.900	.486
ENMESH	.593	.023	25.601	.352
SUBJU	.806	.016	49.162	.650

Table 4.15 Standardized factor loadings, and standard errors of modified four second-order model of early maladaptive schemas (cont.)

EMS	λ	**se**	**t**	$\mathbf{R^2}$
IMP_LIM				
ENTITLE	.639	.024	26.335	.408
INSUFFI	.747	.023	33.136	.558
EXG_STD				
RECOG	.559	.025	21.959	.312
SELFSAC	.418	.031	13.679	.175
UNRELENT	.644	.022	29.176	.415
PESSIM	.817	.016	51.429	.667
PUNITIVE	.664	.022	30.576	.441
Model fit χ^2= 601.948, df = 122, χ^2_{df}= 4.934 , RMSEA = .068(90% CI:.063 - .073),CFI = .907, SRMR = .057				

From Table 4.15, the modified four second-order model of EMSs had acceptable fit indices (χ^2=601.948, df = 122, χ^2/df =4.934, RMSEA =.068, CFI = .907, SRMR = .057). The factor loadings of EMSs on Disconnection and Reject (REJECT) domain ranged from .556 to .804. The factor loadings of EMSs on Impaired Autonomy and Performance (IMP_AUTO) domain valued between .593 and .806. The EMS factor loadings of EMSs on Impaired Limits (IMP_LIM) domain were .639 and .747. The factor loadings of EMSs on Exaggertated Standards (EXG_STD) domain ranged from .418 to .817.

All of these finding suggested that modified four second-order model, consisting of Disconnection and Rejection domain, Impaired Autonomy and Performance domain, Impaired Limits domain, and Exaggerated Standards domain, demonstrated good fit with the empirical data. Therefore, this model would be used in the analysis of structural relationship among EMSs, schema modes and alcohol use.

3.1.2 The validation of measurement model of schema modes

This section described the validation of measurement model of schema modes, which comprised 3 steps of investigation: convergent validation of items within each schema mode, discriminant validation of individual items and schema modes, factorial validation of second-order model of schema modes.

At the beginning, the convergent validity of items belonging to each schema mode was examined. The results are provided in Table 4.16.

Table 4.16 Fit indices and factor loadings for the confirmatory factor analysis of unifactorial schema modes

MODE	χ^2	df	$\chi^2_{/df}$	RMSEA (90% CI)	CFI	SRMR	λ		
							mix	max	average
CHILD									
VULNER	238.583	35	6.817	.077 (.068 – .087)	.902	.050	.389	.783	.598
ANGRY	114.117	35	3.260	.048 (.039 – .058)	.940	.036	.415	.743	.529
ENRAGED	128.366	27	4.754	.062 (.052 - .073)	.910	.045	.516	.688	.625
IMPULSE	53.231	14	3.802	.054 (.039 - .069)	.942	.035	.376	.649	.516
UNDIS	10.898	5	2.180	.035 (.000 - .063)	.983	.022	.413	.598	.496
COPING									
SURREND	56.590	9	6.288	.074 (.056 - .093)	.926	.038	.414	.622	.526
SURREND-modified [a]	22.439	8	2.805	.043 (.023 - .065)	.977	.023	.415	.652	.513
DPROTECT	122.594	27	4.541	.060 (.050 - .071)	.937	.038	.494	.640	.591
DSOOTHER	16.459	2	8.230	.086 (.051 - .127)	.929	.036	.222	.789	.448
DSOOTHER-modified[b]	4.210	1	4.210	.057 (.010 - .119)	.984	.017	.222	.539	.398
AGGRAND	80.629	27	2.986	.045 (.034 - .057)	.943	.035	.339	.667	.484
BULLY	107.706	27	3.989	.055 (.045 - .067)	.903	.041	.346	.623	.475
PARENT									
PUNI_PAR	61.151	35	1.747	.028 (.016 - .035)	.976	.027	.318	.666	.530
DEMAND	94.687	14	6.763	.077 (.063 - .092)	.895	.042	.473	.627	.512
DEMAND-modified[c]	63.832	13	4.910	.060 (.045 - .077)	.940	.031	.403	.638	.501
ADAPTIVE									
HEALTHY	148.446	35	4.241	.058 (.048 - .067)	.927	.039	.434	.690	.545
HAPPY	219.511	35	6.272	.074 (.064 - .083)	.913	.044	.376	.673	.594

[a] re-specified error covariance between the error terms of Item 35 and Item36.

[b] re-specified error covariance between the error terms of Item 39 and Item 54.

[c] re-specified error covariance between the error terms of Item 79 and Item 100.

From Table 4.16, the findings indicated that the eleven out of 14 schema modes demonstrated an acceptable to good fit with empirical data, regarding $\chi^2_{/df}$< 5.0, RMSEA < .08, CFI ≥ .90, and SRMR < .08. With the exception, the results suggested the poor fit of Compliant Surrender (SURREND) ($\chi^2_{/df}$= 6.288, RMSEA = .074, CFI = .926, and SRMR = .038), Detached Self-Soother (DSOOTHER) ($\chi^2_{/df}$= 8.230, RMSEA = .074, CFI = .929, and SRMR = .038), and Demanding Parent (DEMAND) ($\chi^2_{/df}$= 6.763, RMSEA = .077, CFI = .895, and SRMR = .042).

The authors respecified the models of these schema modes taking into account theoretical basis and modification indices. For Compliant Surrender, the error term of Item 35 and Item 36 were set as covariance. After respecified, the model of Compliant Surrender showed good fit ($\chi^2_{/df}$= 2.805, RMSEA = .043, CFI = .977, and SRMR = .023). For Detached Self-Soother, the error term of Item 39 and Item 54 were set as covariance. The respecification resulted the good fit of Detached Self-Soother model ($\chi^2_{/df}$= 4.210, RMSEA = .057, CFI = .984, and SRMR = .017). Finally, for Demanding Parent, the author covaried the error term between item 79 and item 100. The modified model of Demanding Parent showed good fit to data ($\chi^2_{/df}$= 4.910, RMSEA = .060, CFI = .940, and SRMR = .031).

When considering standardized factor loadings of each item, the author found that most of them valued higher than .32 (Tabachnick & Fidell, 2014). These results suggested that individual items of unifactorial subscales were the indicators of same construct, demonstrating the convergent validity of schema mode level. However, it was found that the factor loadings of some items fell short of this criterion: Item 82 (Detached Self-Soother) valued .222; and Item 5 (Punitive Parent: PUNI_PAR) valued .318. The further step of analysis was the discriminant validation of items and schema modes in their respective type of schema modes. The findings are presented in Table 4.17 to 4.20

Table 4.17 Fit indices for the confirmatory factor analysis of models containing items and schema modes in Child modes

Model	χ^2	df	$\chi^2_{/df}$	RMSEA (90% CI)	CFI	ΔCFI	SRMR
One-factor model	2845.126	819	3.474	.050 (.048 - .052)	.593		.081
Five-factor model*	1997.368	809	2.469	.039 (.037 - .041)	.761	.168	.065
Five-factor model-modified*	824.162	420	1.962	.031 (.028 - .035)	.900	.139	.045

* consisting of Vulnerable Child, Angry Child, Enraged Child, Impulsive Child, and Undicipined Child

From Table 4.17, five-factor model of Child modes proposed by Young et al. (2003) had better fit than one factor model (ΔCFI = .168). The results indicated good discriminant validity of schema modes in Child modes. However, the CFI of the five-factor model was .761, which fell short of .90. The author respecified the five-factor model taking into account theoretical basis and modification indices.

It was found that several items indicating high cross-loading with other latent variables. The author decided to drop 10 items from the model, including Item 63 and Item 101 (both Vulnerable Child), Item 45 and Item 105 (both Angry Child), Item 24 and Item 28 (both Enraged child) Item 15, Item 62, and Item 65 (all Undisciplined Child) As a result, the fit indices of the model were improved (χ^2 = 1069.251, df = 424, $\chi^2_{/df}$= .2.522, RMSEA = .040, CFI = .840, SRMR = .050), but were less than the acceptable values. The author then repecified the model by re-specifying the four covariances of error term including, Item 6 and Item 34 (both Vulnerable Child), Item 48 and Item 67 (both Vulnerable Child), Item 75 and Item 99 (both Angry Child), , and Item 44 and Item 94 (both Enraged Child). Consequently, the modified five-factor model demonstrated a good fit indices (χ^2 = 824.162, df = 420, $\chi^2_{/df}$= 1.962, RMSEA = .031, CFI = .900, SRMR = .045). The items remaining in the model were supported for their good discriminant validity.

Table 4.18 Fit indices for the confirmatory factor analysis of models containing items and schema modes in Maladaptive Coping modes

Model	χ^2	df	$\chi^2_{/df}$	RMSEA (90% CI)	CFI	ΔCFI	SRMR
One-factor model	3998.287	629	6.357	.074 (.072 - .076)	.608		.071
Five-factor model*	1546.917	692	2.235	.036 (.033 - .038)	.782	.174	.055
Five-factor model-modified*	634.987	337	1.884	.030 (.903- .890)	.903	.903	.042

* consisting of Compliant Surrender, Detached Protector, Detached Self-Soother, Self-Aggrandizer, and Bully and Attack

From Table 4.18, five-factor model of Maladaptive Coping modes proposed by Young et al. (2003) had better fit than one factor model (ΔCFI = .174). The results indicated good discriminant validity of schema modes in Maladaptive Coping modes. However, the CFI of the five-factor model was .782, which fell short of .90. The author respecified the five-factor model taking into account theoretical basis and modification indices.

According to the results, ten items were dropped due to high cross-loading with other latent variables: Item 104 (Compliant surrender), Item 37 and Item 84 (both Detached Protector), Item 10,Item 42, and Item 85 (all Self-Aggrandizer), Item 98 and Item 107 (both Bully and Attack), Item 82 (Detacher Self-Soother). After dropping these items, the fit indices were improved, χ^2 = 751.379 df = 340, $\chi^2_{/df}$= 2.210, RMSEA = .035, CFI = .865 SRMR = .045. Nevertheless, the CFI fell slightly from .90. The author continued modifying the model by setting three covarinces between the error term, namely Item 35 and Item 36 (both Compliant Surrender), Item 31 and Item 32 (both Detached Protector) and Item 26 and Item 109 (both Self Aggrandizer) to covary. Through there, the modified five-factor model of Maladaptive Coping modes had a good fit, χ^2 = 634.987 df = 337, $\chi^2_{/df}$= 1.884, RMSEA = .030, CFI = .903 SRMR = .042. The items remaining in the model were supported for their good discriminant validity.

Table 4.19 Fit indices for the confirmatory factor analysis of models containing items and schema modes in Dysfunctional Parent modes

Model	χ^2	df	$\chi^2_{/df}$	RMSEA (90% CI)	CFI	ΔCFI	SRMR
One-factor model	666.697	119	5.602	.069 (.064 - .074)	.696		.082
Two-factor model*	318.850	118	2.702	.042 (.036 - .047)	.888	.192	.052
Two-factor model-modified*	288.637	117	2.467	.039 (.033 - .045)	.905	.017	.049

* consisting of Punitive Parent, and Demanding Parent

From Table 4.19, two-factor model of Dysfunctional Parent modes proposed by Young et al. (2003) had better fit than one factor model (ΔCFI = .192). The results indicated good discriminant validity of schema modes in Dysfunctional Parent modes. However, the CFI of the two-factor model was .888, which fell short of .90. The author respecified the two-factor model taking into account theoretical basis and modification indices. The covariance of error term between Item 79 and Item 100 (both Demanding Parent) was set to covary. As a result, the modified two-factor model demonstrated good fit (χ^2 = 288.637, df = 117, $\chi^2_{/df}$= 2.467, RMSEA = .039, CFI = .905 SRMR = .049). The items remaining in the model were supported for their good discriminant validity.

Table 4.20 Fit indices for the confirmatory factor analysis of models containing items and schema modes in Adaptive Modes

Model	χ^2	df	$\chi^2_{/df}$	RMSEA (90% CI)	CFI	ΔCFI	SRMR
One-factor model	886.061	170	5.212	.066 (.062 - .070)	.807		.060
Two-factor model*	708.959	169	4.195	.057 (.053 - .062)	.854	.047	.054
Two-factor model-modified*	480.373	148	3.246	.048 (.043 - .053)	.904	.050	.045

* consisting of Healthy Adult, and Happy Child

From Table 4.20, two-factor model of Healthy modes proposed by Young et al. (2003) had better fit than one factor model (ΔCFI = .047). The results indicated good discriminant validity of schema modes in Healthy modes. However, the CFI of the two-

factor model was .854, which fell short of .90. The author respecified the two-factor model taking into account theoretical basis and modification indices.

The author dropped Item 114 (Healthy Adult) due to high cross loading with Happy Child. In addition, the three covariances between term error term were set, including, Item 81 and Item 76 (both Healthy Adult), Item 57 and Item 91 (both Happy Child), and Item 91 and Item 92 (both Happy Child). After modified, the model showed good fit (χ^2 = 480.373, df = 148, χ^2_{df}= 3.246, RMSEA = ..048, CFI = .904 SRMR = .045). The items remaining in the model were supported for their good discriminant validity.

All of these findings supported both convergent and discriminant validity of remaining items and schema modes. Further, the author examined the second-order model at the type of schema mode level. In accordance with the validation process of EMSs, the item parceling approach was applied. The scores of each schema mode were derived from averaging of individual items belonging to their constructs. The parcel scores were subsequently used in second-order confirmatory factor analysis.

Table 4.21 Standardized factor loadings, and standard errors of second-order model of schema modes proposed by Young at el. (2003)

MODE	λ	se	t	R^2
CHILD				
VULNER	.711	.018	40.271	.505
ANGRY	.779	.015	53.448	.607
ENRAGED	.674	.021	31.817	.454
IMPULSE	.753	.017	45.426	.566
UNDIS	.627	.020	30.722	.393

Table 4.21 Standardized factor loadings, and standard errors of second-order model of schema modes proposed by Young at el. (2003) (cont.)

MODE	λ	se	t	R^2
COPING				
SURREND	.564	.024	23.330	.318
DPROTECT	.607	.022	28.205	.369
DSOOTHER	.557	.025	22.212	.311
AGGRAND	.703	.017	40.183	.494
BULLY	.689	.018	38.445	.474
PARENT				
PUNI_PAR	.609	.027	22.988	.371
DEMAND	.520	.027	19.528	.271
ADAPTIVE				
HAPPY	.705	.024	27.570	.496
HEALTHY	.856	.031	32.064	.733
Model fit				
χ^2=1312.682, df = 71, $\chi^2_{/df}$= 18.488 RMSEA = .134 (90%CI : .128 - .140),CFI = .734, SRMR = .104				

As represented in Table 4.13, the results showed that the second-order model of schema modes proposed by Young at el. (2003) had fit indices lower than acceptable range (χ^2=1312.682, df = 71, χ^2/df = 18.488, RMSEA =.134, CFI = .734, SRMR = .104).

The factor loadings of schema modes on Child Mode (CHILD) ranged from .627 to .779. The factor loadings of schema modes on Maladaptive Coping mode (COPING) valued between .557 and .703. The factor loadings of schema modes on Dysfunctional Parent mode (PARENT) valued .520 and .609. The factor loadings of schema modes on Adaptive mode (ADAPTIVE) were 705 and .856.

According to the results, the second-order factor structure of schema modes proposed by Young et al. (2003) was not supported. Unfortunately, to our knowledge, there was no alternative second-order model of schema modes suggested by other researchers. The author, therefore, decided to investigate underlying second-order factor structure of schema mode. The exploratory factor analysis with maximum likelihood estimation and promax rotation was utilized. The results are presented below.

Table 4.22 Fit indices and model comparisons for exploratory factor analysis of second-order model of schema modes

Model	χ^2	df	RMSEA (90% CI)	$\Delta\chi^2$	Δdf	p-value
One-factor model	2012.462	77	.161 (.155 - .167)			
Two-factor model	948.403	64	.119 (.113 - .126)	1064.059	13	<.001
Three-factor model	421.070	52	.085 (.078 - .093)	527.333	12	<.001
Four-factor model	222.671	41	.067 (.059 - .076)	198.399	11	<.001
Five-factor model	147.259	31	.062 (.052 - .072)	75.412	10	<.001
Six-factor model	N/A					

From Table 4.22, it was found that four-factor model and five-factor model demonstrated good fit to empirical data (RMSEA = .067 and .062 respectively). Nevertheless, the χ^2 goodness of fit of the five-factor model was significantly better than the four-factor model ($\Delta\chi^2$=75.412, Δdf = 10, p<.001). Moreover, by taking into account theoretical basis, the five-factor model provided meaningfully interpretable structure. Hence, the author preferred five-factor model for the current research. The details of each factor are provided below.

The first factor consisted of Vulnerable Child, Compliant Surrender, Detached Protector, Punitive Parent, and Demanding Parent. The factor loadings ranged from .460 to .818; the highest factor loading was Vulnerable Child and the lowest one was Demanding Parent. The author labeled this factor as Internalizing Mode (INTERNAL), which are characterized by cognition, affection, and behaviors that are turned inward to the self. These may involve depression, anxiety, helplessness, hopelessness, suppression of others negative emotions as well as social withdrawal, surrender to other, and self-blaming. Moreover, people with this mode tend to set rigid standards or goal for themselves or others, which cause stress and lead to failure.

The second factor is comprised of Self-Aggrandizer, and Bully and Attack, whose factor loadings valued .480 and .878 respectively. The author labeled this factor as Overcompensation mode (OVERCOM), which is characterized by cognition, affection, and behaviors that individuals adopt to respond the threatening situation or

environment in extreme way and improper manner (e.g., overly aggressive, over-confident).

The third factor is comprised of Happy Child and Healthy Adult, whose factor loadings were .908 and .655. This factor was named Adaptive mode (ADPATIVE). It is defined by cognition, affection and behaviors that individuals utilize to respond the environment appropriately. They tend to have positive and neutralized thought and feeling about themselves, and feel love and content.

The fourth factor has only Detached Self-Soother that had an adequate factor loading. The factor loading valued .531. This factor was labeled as Avoidance mode (AVOID), so that it characterized by individuals adopted avoidance coping responses to deal with situations that trigger their EMS.

The fifth factor is comprised of Angry Child, Enraged Child, Impulsive Child, and Undisciplined Child. The factor loadings ranged between .334 and .756; the highest factor loading was Angry Child and the lowest one was Impulsive Child. The author named this factor as Spoiled Child (SPOIL). It is characterized by cognition, affection, and behaviors that individuals respond to the environment like a spoiled child, such as directly expressing their anger to others, losing their temper and vandalizing objects, acting impulsively to pursue pleasure regardless of limits or concern for others.

This five second-order model of schema modes was further validated by confirmatory factor analysis. The Detached Self-Soother was an only indicator of Avoidance mode. The author employed the method of specifying an single indicator for latent variable suggested by Joreskog and Sorbom (1993), that error variance of the indicator is fixed to (1-reliability) x (variance of the observed indicator). The results are presented in Table 4.23.

Table 4.23 Standardized factor loadings, standard errors for five second-order model of schema modes.

MODE	λ	SE	t	R^2
INTERNAL				
VULNER	.786	.018	43.217	.618
PUNI_PAR	.781	.018	44.480	.609
DEMAND	.461	.029	16.037	.213
SURREND	.512	.031	16.662	.262
DPROTECT	.732	.020	37.397	.536
OVER_COM				
AGGRAND	.812	.018	46.039	.659
BULLY	.753	.019	39.775	.568
ADAPTIVE				
HAPPY	.846	.029	28.949	.716
HEALTHY	.753	.029	25.163	.515
AVIOD				
DSOOTHER	.817	.009	91.217	
SPOIL				
ANGRY	.777	.017	45.777	.604
ENRAGED	.721	.021	34.711	.520
IMPULSE	.797	.016	49.955	.634
UNDIS	.621	.023	27.489	.385
Model fit				
χ^2= 765.183, df = 68, $\chi^2_{/df}$= 11.253, RMSEA = .103 (90% CI: .096 - .109), CFI = .837, SRMR = .082				

As represented in Table 4.23, the results indicated that the fit indices of five second-order model were still lower than acceptable fit (χ^2=765.183, df = 68, χ^2/df =11.253, RMSEA =.103, CFI = .837, SRMR = .082).

The factor loadings of schema modes on Internalizing mode (INTERNAL) ranged between .461 and .786. The factor loadings of schema modes on

Overcompensation mode were .753 and .812. The factor loadings of schema modes on Adaptive mode (ADAPTIVE) were .846 and .753. The factor loading of Detached Protector on Avoidance mode (AVOID) was .817. And, the factor loadings of schema modes on Spoiled Child mode (SPOIL) valued between .621 and .797.

As describe above, although the exploratory factor analysis indicated that the five-second order model fit well with the data, the results of confirmatory factor analysis indicated poor fit. This is because exploratory factor analysis allows all indicators to free to load on all latent variables, whereas confirmatory factor analysis allows fixes indicators to load on specific latent variable (Stevens, 2009). The author modified the model by allowing the error terms between certain schema modes to covary, namely;

- Enraged Child and Impulsive Child
- Undisciplined Child and Impulsive Child
- Angry Child and Enraged Child
- Demanding Parent and Compliant Surrender
- Punitive Parent and Enraged Child
- Happy Child and Demanding Parent
- Happy Child and Compliant Surrender
- Happy Child and Bully and Attack
- Healthy Adult and Angry Child
- Healthy Adult and Compliant Surrender
- Healthy Adult and Impulsive Child
- Healthy Adult and Demanding Parent

The results of model respecifiation are presented in Table 4.24.

Table 4.24 Standardized factor loadings, standard errors for modified five second-order model of schema modes.

MODE	λ	SE	t	R^2
INTERNAL				
VULNER	.807	.017	46.728	.652
PUNI_PAR	.773	.018	43.011	.597
DEMAND	.666	.038	17.286	.606
SURREND	.630	.036	17.690	.371
DPROTECT	.733	.020	37.606	.538
OVER_COM				
AGGRAND	.794	.018	44.297	.630
BULLY	.765	.019	40.568	.585
ADAPTIVE				
HAPPY	.964	.017	46.931	.930
HEALTHY	.630	.025	26.574	.397
AVOID				
DSOOTHER	.817	.009	89.009	.668
SPOIL				
ANGRY	.806	.017	46.931	.649
ENRAGED	.659	.025	26.574	.434
IMPULSE	.732	.066	38.018	.536
UNDIS	.605	.049	24.877	.366
Model fit				
χ^2=277.759, df =56, $\chi^2_{/df}$= 4.960 , RMSEA = .064 (90% CI: .056 - .071),CFI =.948, SRMR = .040				

As represented in Table 4.24, the fit indices of modified five second-order model indicated good fit to the empirical data (χ^2=277.759, df = 59, χ^2/df =4.960, RMSEA =.064, CFI = .948, SRMR = .040).

The factor loadings of schema modes on Internalizing mode (INTERNAL) ranged between .630 and .807. The factor loadings of schema modes on

Overcompensation mode were .794 and .765. The factor loadings of schema modes on Adaptive mode (ADAPTIVE) were .964 and .630. The factor loading of Detached Protector on Avoidance mode (AVOID) was .817. And, the factor loadings of schema modes on Spoiled Child mode (SPOIL) valued between .605 and .806.

All of these finding suggested that modified five second-order model of schema modes, which is comprised of Internalizing mode, Adaptive mode, Avoidance mode, and Spoiled Child mode, demonstrated good fit with the empirical data. Therefore, this measurement model would be used in the analysis of structural relationship among EMS, schema modes, and alcohol use.

3.2 The validation of structural relationship among early maladaptive schemas, schema modes, and alcohol use

The objective of this study was to develop and validate the structural model of relationship between EMS, schema modes, and alcohol use. The structural equation modeling was performed to examine the fit between hypothesized model and empirical data, and to estimate path coefficient indicating the association between variables. The hypothesized model, developed from the literature review, showed poor fit to the data (χ^2=5380.373, df = 533, χ^2/df =10.095, RMSEA =.097, CFI = .748, SRMR = .086). As discussed earlier, the findings of the current study found that Young et al. (2003)'s theoretical model –both EMS and schema modes- were not supported. These findings suggested that the potential sources of poor fit were the misspecification of measurement model. Hence, the author modified the structural model taking into account the results from the first step of analyses, validating measurement model. The modified model is illustrated in Figure 4.1.

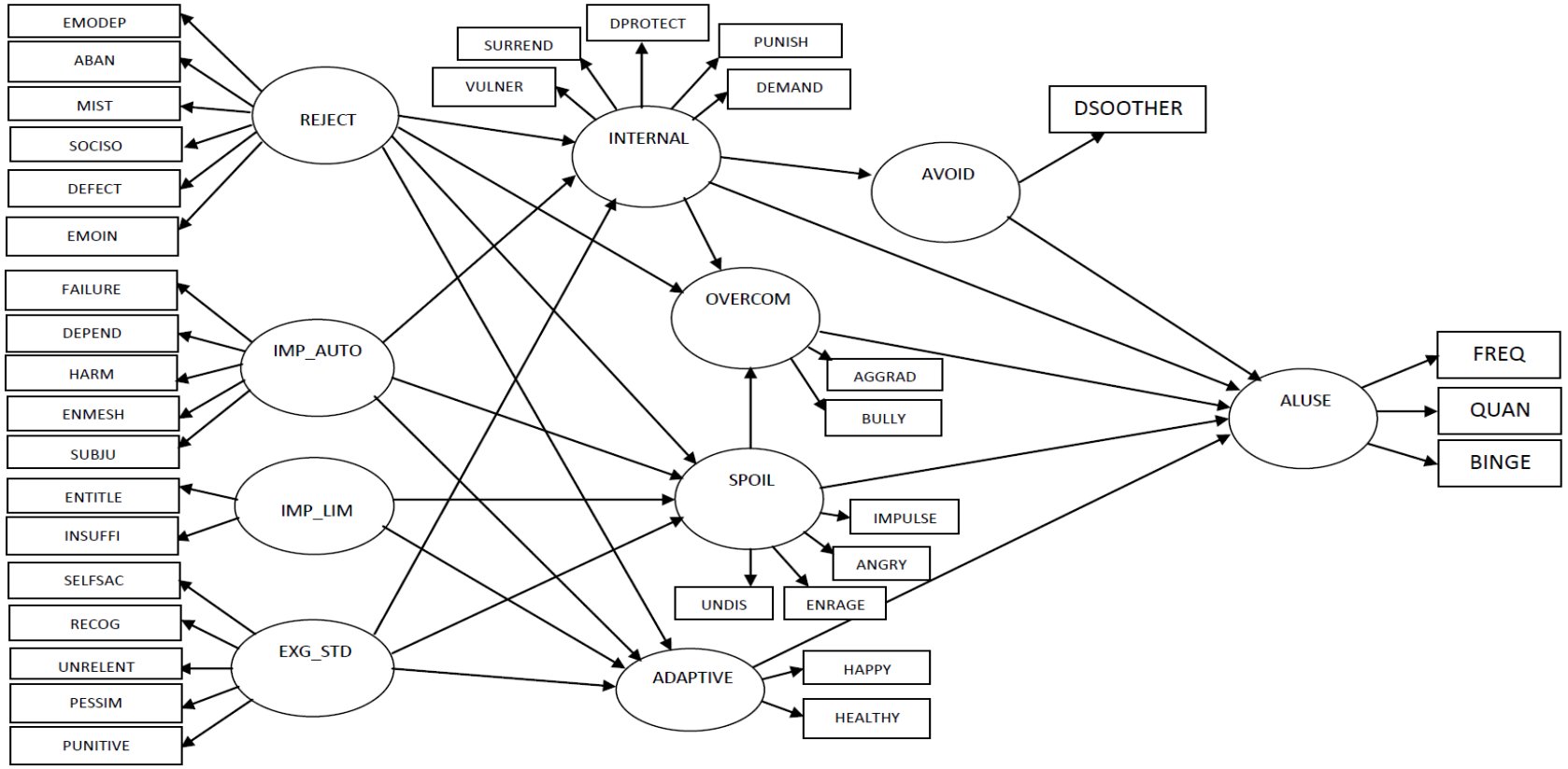

Figure 4.1 The structural model of the relationship among EMS, schema modes and alcohol use, which had been modified in accordance with the findings form measurement model validation

After the respecification, the fit indices of the structural model were improved (χ^2=3199.570, df = 516, χ^2/df =6.201, RMSEA =.073, CFI = .841, SRMR = ..074). However, the fit indices were still less than the acceptable values. The author continuingly modified the model, taking into account theoretical consideration and modification indices, as follows;

1. The path from Impaired Autonomy and Performance domain to Internalizing mode was deleted.

2. The paths from Disconnection and Rejection domain, Impaired Limits domain, Exaggerated Standards domain, and Internalizing mode to Spoiled Child mode were deleted.

3. The paths from Impaired Autonomy and Performance domain, and Impaired Limits domain to Avoidance mode were added.

4. The path from Adaptive mode to Spoiled Child was added.

5. The paths from Impaired Autonomy and Performance domain, and Exaggerated Standards domain to Adaptive mode were deleted.

6. The paths from Disconnection and Rejection domain, and Spoiled Child mode to Overcompensation mode were deleted.

7. The path from Impaired Autonomy and Performance domain to alcohol use was added.

8. The certain covariances between error terms were respecified.

After modified, the model was fit with the data. The findings are presented in Table 4.25.

Table 4.25 Fit indices of the structural model of relationship among EMS, schema modes, and alcohol use

Model	χ^2	df	χ^2/df	RMSEA (90% CI)	CFI	ΔCFI	SRMR
Hypothesized model	5380.373	533	10.095	.097 (.094-.099)	.748		.086
Hypothesized model – modified[a]	3199.570	516	6.201	.073 (.071-.076)	.841	.093	.074
Hypothesized model - modified[b]	2185.313	491	4.451	.060 (.057 - .062)	.900	.059	.062

[a] – respecified the measurement model

[b] – respecified the measurement model and structural paths

As represented in Table 4.25, the model after respecified measurement model and structural paths showed good fit to the empirical data (χ^2=2185.313, df = 419, χ^2/df =4.451, RMSEA =.060, CFI = .900, SRMR = .062). All of these findings supported the main hypothesis of the current study that the hypothesized model of the structural relationship among EMSs, schema modes, and alcohol use is fit with the empirical data. The results are presented in Figure 4.2 and Table 4.26.

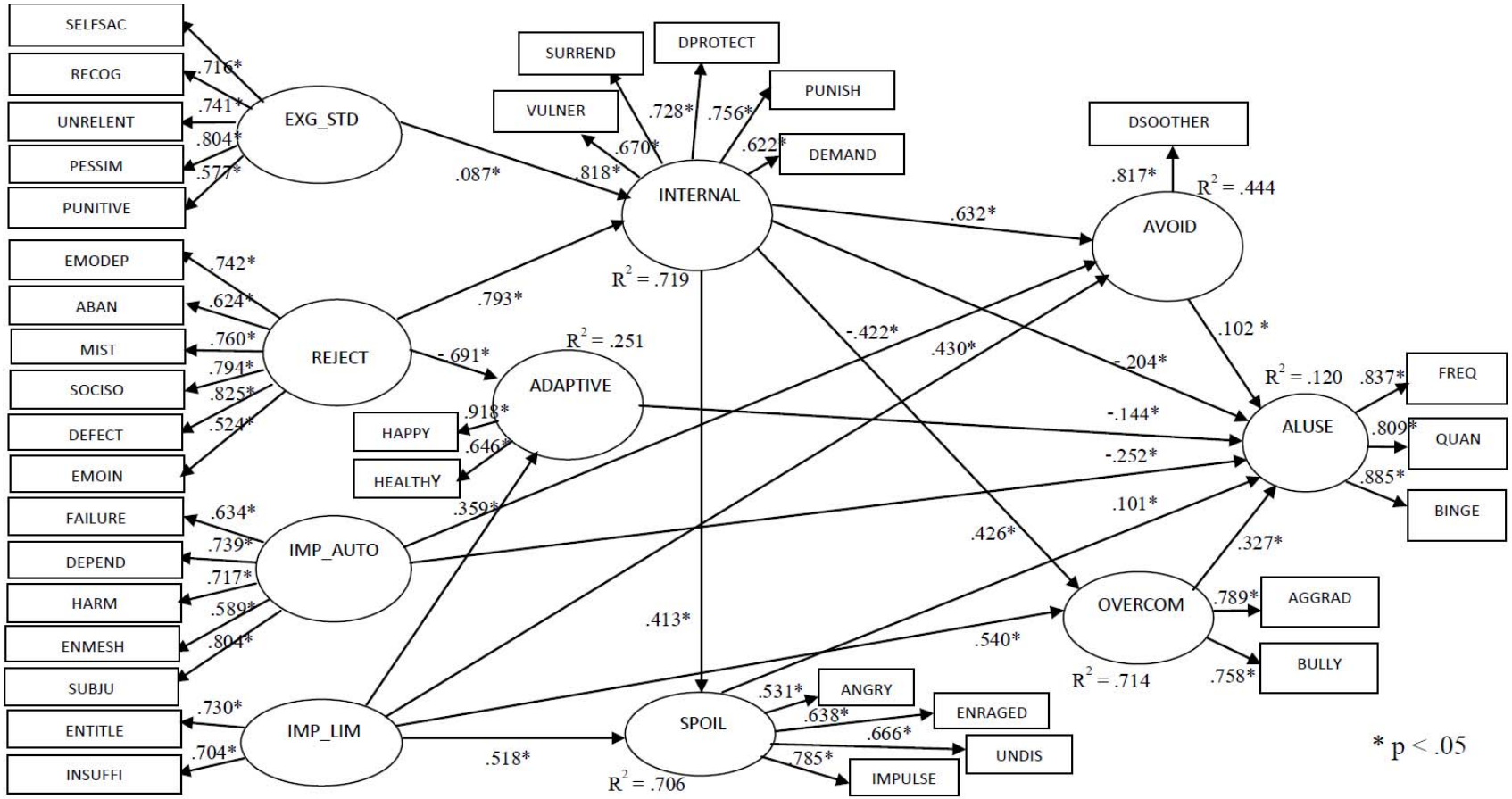

Figure 4.2 The structural model of the relationship between EMS, schema mode, and alcohol use among student, which has been respecified the measurement model and structural paths

Table 4.26 Coefficient of determination, standardized direct and indirect effects for the structural relationship among EMSs, schema modes, and alcohol use

Variables	Effect	Variables					
		INTERNAL	SPOIL	OVERCOM	AVOID	ADAPTIVE	ALUSE
EMS							
REJECT	DE	.793*	-	-	-	-.691*	-
	IE	-	.327*	.131*	.501*	-	.132*
	TE	.793*	.327*	.131*	.501*	-.691*	.132*
IMP_AUTO	DE	-	-	-	-.422*	-	-.252*
	IE	-	-	-	-	-	-.043
	TE	-	-	-	-.422*	-	-.295*
IMP_LIM	DE	-	.387*	.540*	.430*	.359*	-
	IE	-	-	-	-	-	.221*
	TE	-	.387*	.540*	.430*	.359*	.221*
EXG_STD	DE	.087*	-	-	-	-	-
	IE	-	.036*	.037*	.055*	-	.004
	TE	.087*	.036*	.037*	.055*	-	.004
MODE							
INTERNAL	DE	-	.413*	426*	.632*	-	-.204*
	IE	-	-	-	-	-	.245*
	TE	-	.413*	.426*	.632*	-	.041
SPOIL	DE	-	-	-	-	-	.101*
	IE	-	-	-	-	-	-
	TE	-	-	-	-	-	.101*
OVERCOM	DE	-	-	-	-	-	.327*
	IE	-	-	-	-	-	-
	TE	-	-	-	-	-	.327*
AVOID	DE	-	-	-	-	-	.102*
	IE	-	-	-	-	-	-
	TE	-	-	-	-	-	.102*
ADAPTIVE	DE	-	-	.298*	-	-	-.144*
	IE	-	-	-	-	-	-
	TE	-	-	.298*	-	-	-.144*
R^2		.719	.706	.714	.444	.251	.120

* $p < .05$

As represented in Table 4.26, it was found that Disconnection and Rejection domain (REJECT) and Impaired Limits domain (IMP_LIM) were positively associated with alcohol use with statistical significance (TE = .132 and .221

respectively). Impaired Autonomy and Performance Domain (IMP_AUTO) was negatively related to alcohol use (TE = -.295). In addition, Exaggerated Standards domain (EXG_STD) was not significantly associated with alcohol use (ALUSE) (TE = .004). *Hence, the results partially supported the first sub hypothesis that schema domains are associated with alcohol use among college students.*

It was found that Disconnection and Rejection domain (REJECT) had the statistically significant total effect on schema modes. It had the direct effects on Internalizing modes (INTERNAL) (TE = .793) and Adaptive mode (ADAPTIVE) (TE = -.691). Moreover, this domain was indirectly related to Avoidance mode (AVOID) (TE = .501), Spoiled Child mode (SPOIL) (TE =.327) and Overcompensation mode (OVERCOM) (TE = .131).

Impaired Autonomy and Performance domain (IMP_AUTO) had the significant direct effect on Avoidance mode (AVIOD) (TE = -.422). The associations with other modes were not found with statistical significance.

Impaired Limits domain (IMP_LIM) had the significant direct effects on Avoidance mode (AVOID) (TE = .430), Spoiled Child mode (SPOIL) (TE = .387), Overcompensation mode (OVERCOM) (TE = .540), and Adaptive mode (ADAPTIVE) (TE = .359).

Exaggerated Standards domain (EXG_STD) was directly related to Internalizing mode (INTERNAL) (TE = .087). Also, this domain had the significant indirect effects on Spoiled Child mode (SPOILED), Overcompensation mode (OVERCOM) and Avoidance mode (AVOID) (TE = .036, .037 and .055 respectively). *Putting it all together, the findings supported second sub hypothesis that each schema domain has a specific relationship with schema modes.*

Additionally, the finding suggested that Disconnect and Rejection domain (REJECT) and Impaired Limits domain (IMP_LIM) were positively related to alcohol use, which schema modes fully mediated these relationships. The relationship between Impaired Autonomy and Performance domain (IMP_LIM) and alcohol use was partially mediated by schema modes (DE = -.230, IE = -.050, and TE = -.280). For Exaggerated Standards domain, there was no statistically significant association between this domain and alcohol use. *Therefore, the third sub hypothesis that schema*

modes serve as mediating factor underlying the relationship between EMSs and alcohol use was partially supported.

The EMSs, and schema modes can explain the variance of alcohol use among college students for 12%, which could be considered a moderate effect size (Cohen, 1992).

CHAPTER V
CONCLUSION DISCUSSION AND RECOMMENDATIONS

The objectives of this study were to develop and examine the structural relationship between early maladaptive schemas (EMSs), schema modes, and alcohol use among college students. The author adopted structural equation modeling framework to analyze the structural relationship.

The main hypothesis of the current study is that the hypothesized model of the structural relationship among EMSs, schema modes, and alcohol use is fit with empirical data. The main hypothesis can be divided into 3 sub-hypotheses. First, schema domains are associated with alcohol use among college students. Second, each schema domain has a specific relationship with schema modes. Third, schema modes serve as mediating factor underlying the relationship between EMSs and alcohol use.

A total 973 participants of the current study were selected by cluster random sampling. Three research questionnaires were administrated, including Young Schema Questionnaire 3^{ed} –Short Form (YSQ-3s), Schema Mode Inventory, and Alcohol Use Questionnaire.

For data analyses, a variety of descriptive statistics was performed by SPSS software, including frequency, percentage, arithmetic mean, standard deviation, skewness, and kurtosis. Moreover, the mediation analysis with structural equation modeling was conducted, using Mplus software.

In this chapter, the conclusion, discussion, and recommendation of the current study will be presented.

Conclusion

1. Demographic data and drinking behaviors of the participants and descriptive statistics of the variables in this study.

The participants of this study were 973 undergraduate students, dividing into 578 females (59.5%) and 394 males (40.5%). The mean age was 19.89 ± 1.475 years. Most of them were studying in first year (38.4%), in Social Sciences and Humanities faculty group (57.5%). 646 participants (66.4%) had drunk alcohol at least once in the past year. Among those who had drunk, they reported that beer was a drink of choice (94.7%). The most common drinking occasion was to socialize with friends (94.1%). They usually drank with their friends (89.9% with small group not more than 4 persons and 91.2 with large group 5 persons or more). The location where the most of the drinking took place was restaurant and bar (91.5%). Most of them drank 2 times or less a month (70.3%), and drank 1 – 2 standard drink(s) per occasion (24.8). It was remarkable that 19.7% of them usually drank 14 standard drinks or more per occasion. For binge drinking, it was found that 69.1% of them engaged in binge drinking 2 times or less.

The mean scores of EMSs ranged between 1.91 and 3.77. The mean score was highest for Punitiveness (M = 3.77, SD = .83), followed by Self-Sacrifice and Unrelenting Standards (M = 3.58, SD = .81; and M = 1.94, SD = .70 respectively). The mean score of Defectiveness was rated lowest 1.91, SD = .84). The mean score of Dependence was the second (M = 1.94, SD = .70). The mean scores of schema modes ranged from 1.64 to 3.99. The mean score was highest for Healthy Adult (M = 3.99, SD = .78), closely followed by Happy Child (M = 3.94, SD = .79). The mean score of Enraged Child was the lowest (M = 1.64, SD= .64).

2. The validation of measurement model of early maladaptive schemas and schema modes

2.1 For measurement model of EMSs, the results demonstrated good convergent and discriminant validity of individual items and EMSs. Nevertheless, the findings do not support the theoretical five second-order model proposed by Young et al. (2003). The results also indicate the poor fit with the data of all alternative model namely, one second-order model, Calvete, Orue, and González-Diez (2012)'s 3-factor model, Saritaş and Gençöz (2011)'s 3-factor model, and

Soygüt, Karaosmanoğlu, and Çakir (2009)'s 5-factor model. In the current study, the four second-order solution, which comprised Disconnect and Rejection domain, Impaired Autonomy and Performance Domain, Impaired Limits domain, and Exaggerated Standards domain, was produced. This four second-order model demonstrated good fit to the data (χ^2= 601.948, df = 122, χ^2_{df}= 4.934, RMSEA = .068 (90% CI: .063 - .073), CFI = .907, SRMR = .057).

2.2 For measurement model of schema modes, the results supported good convergent and discriminant validity of individual items and first-order schema modes. However, the results failed to support Young et al. (2003)'s theoretical four second-order model. Exploratory factor analysis was performed to investigate underlying second-order of schema modes. The five second-order solution was produced, which consisted of Internalizing mode, Overcompensation mode, Adaptive mode, Avoidance mode, Spoiled Child mode. With some model respecificaton, the five second-order model showed good fit (χ^2=277.759, df =56, χ^2_{df}= 4.960, RMSEA = .064 (90% CI: .056 - .071), CFI =.948, SRMR = .040).

3. The validation of structural relationship among early maladaptive schemas, schema modes, and alcohol use

The results showed that the modified hypothesized model of relationship among EMSs, schema modes, and alcohol use among college students was fit with the empirical data (χ^2= 2185.313, df = 491, χ^2_{df} = 4.451, RMSEA = .060 (90% CI: .057 - .062), CFI =.900, and SRMR = .062). The EMSs and schema modes could explain the variance of alcohol use, both directly and indirectly, among college students for 12%. It was found that different schema domains had different schema mode pathways to use alcohol. Disconnect and Rejection domain and Impaired Limits domain were positively associated with alcohol use; these relationships were fully mediated by schema modes. The total effects on alcohol use were .132 and .221 respectively. Impaired Autonomy and Performance domain had the negative association with alcohol use, which was partially mediated by schema modes (total effect = -.295: direct effect = -.252, and indirect effect = -.043). Exaggerated Standards domain was no significant associated with alcohol use. For schema mode, Spoiled Child mode, Overcompensation mode, Avoidance mode, and Adaptive mode were significantly

related to alcohol use (total effect = .101, .327, 1.02 and -.144 respectively). For Internalizing mode, although the total effect on alcohol use was not statistically significant (total effect = .041), the direct effect and indirect effect were significant (-.204 and .245 respectively).

Discussion

The current study provides a greater understanding of the relationship between EMSs and alcohol use among college students. Moreover, the study elucidates the role of schema modes as a schema process underlying the relationship. According to the literature review, the number of studies focusing on the relationship was limited. To our knowledge, this is the first study investigating the mediating role of schema modes that underlies the relationship between EMSs and alcohol use. Furthermore, no studies in Thailand regarding schema theory have been published. Therefore, the current study focused on the validation of schema theory in terms of measurement models and its application on alcohol use among college students, which will provide groundwork for practice and facilitate research activities of schema therapy in Thailand.

The discussion of the current study were divided into 3 main issues: 1) the description and discussion concerning demographic data and drinking behaviors of the participants and descriptive statistics of the variables in this study, 2) the discussion pertaining to measurement model validation of EMSs and schema modes, and 3) the discussion in regard to an examination of structural relationship between EMSs and alcohol use among college students which schema mode has a role as a mediating factor.

1. Demographic data and drinking behaviors of the participants and descriptive statistics of the variables in this study.

The samples of this study comprised 59.5% women and 40.5% men. The gender proportion of the sample of this study is similar to the population of undergraduate students in Chiang Mai in 2014, which consisted of 57.9% women and 42.1% men (Office of the Higher Education Commisson, 2015). The participants mainly study in the Humanities and Social Sciences faculty group 57.5%. The result is

in accord with statistical information from the Office of the Higher Education Commisson (2015), which found that 59.5% of undergraduate student population were studying in Humanities and Social Sciences faculty group. In terms of the years of study, the highest proportion of samples is first-year students (38.4%) while the lowest proportion is senior students (13.7%). However, the Office of the Higher Education Commisson (2015) reported different proportion of undergraduate students in Chiang Mai. From the report, there were 26.8% first-year students and 18.8% fourth-year students. The possible explanation of the different proportion is that fourth-year students in many faculties were doing a practicum during data collecting process, so their proportion is lower than expected. Nonetheless, as the first-year students are the largest group, it can be rather beneficial for generalizing the findings into the real world college drinking contexts. This is because many students initiate heavy drinking during their first year in college. Task Force of the National Advisory Council on Alcohol Abuse and Alcoholism (2002) stated that the first year in university, especially the first 6 weeks are critical transitional period. If a student fails to adapt into campus life, it can lead to heavy drinking and alcohol-related problems. Hence, the findings of this study can be utilized for intervention development targeting this early, critical transitional period. Furthermore, the results of this study can reflect the real world contexts of college drinking as some senior students who were doing a practicum in external organizations are unable to access alcohol interventions in a college setting.

For drinking behaviors, 66.4% of participants had drunk alcohol at least once in the past year. This proportion is relevant to the study of Kitchua, Tenitsara, Thirasilawet, and Kanasri (2012), which found that 63.3 of students had drunk alcohol drink in past 1 year. Among those who had drunk, they reported that beer was a drink of choice (94.7%), the most common drinking occasion was to socialize with friends (94.1%). These results in alcohol use is according to several previous studies in college students; in Northern region of Thailand (e.g., Pongnil & Olanwat, 2009; Sakulsriprasert, Sukhatunga, & Ngamthipwatthana, 2008) and other regions such as North Eastern region (e.g., Arunpongpaisal, Rangseekajee, Virasiri, & Sraprom, 2006; Chairak, 2010; Kitchua et al., 2012), Bangkok and metropolitan areas (e.g., Inklub, 2008; Lapyai, 2006) and Southern region (e.g., Bunnag & Intasaro, 2009).

Most of them (70.3%) drank 2 times or less a month, and drank 1 – 2 standard drink(s) per occasion (24.8%). It was remarkable that 19.7% of them usually drank 14 standard drinks or more per occasion. For binge drinking, it was found that 69.1% of them engaged in binge drinking 2 times or less (32.4% for none, 36.7% for 1-2 times). Similarly, Chairak (2010) found that 67.3% of college students of Suranaree University of Technology drank less than 1-2 times per month (probably once a semester). The study of Inklub (2008) found that 75.9% of students drank alcohol drinks no more than twice a month. For the quantity of alcohol use, 24.8% had 1-2 standard drink(s) per occasion. However, 19.7% of the participants usually drank 14 standard drinks or more. The findings of this study correspond with the study of Task Force of the National Advisory Council on Alcohol Abuse and Alcoholism (2002), which indicated that even though heavy-drinking students was one fifth of entire students, they consume 68% of the entire amount of alcohol drinks. Moreover, the median of alcohol consumed by heavy-drinking students was 14.5 standard drinks per week while the mean was only 3.7 standard drinks per week. The findings of the current study, therefore, indicate that the drinking pattern of college students varies from person to person. For campaigns and interventions to be effective, they should be tailored to address the concerns of individuals with different drinking pattern.

For EMSs, it was found that the mean scores of EMSs ranged between 1.91 and 3.77. The mean score was highest for Punitiveness (M = 3.77, SD = .83), followed by Self-Sacrifice, and Unrelenting Standards (M = 3.58, SD = .81; and M = 1.94, SD = .70 respectively). Overall, considering from 5 schema domains, the participants have relatively high score in the Over-Vigilance and Inhibition domain. The results of this study are relevant to the findings from other previous studies in college students and non-clinical population. For example, the study of Hawke and Provencher (2012) found that the participants who were college students had the highest score in Unrelenting Standards (M = 3.20, SD = .89), followed by Self-Sacrifice (M = 2.93, SD = .97). Furthermore, the score of Over-Vigilance and Inhibition domain was higher than other domains. Consistent with Calvete et al. (2012), they found that the student samples had the highest score in Unrelenting Standards (M =3.49, SD = .81), followed by Self-Sacrifice (M = 3.34, SD = .90). Also,

the Over-Vigilance and Inhibition domain was rather higher than other domains as well.

For schema modes, the mean scores of schema modes ranged from 1.64 to 3.99. The mean score was highest for Healthy Adult (M = 3.99, SD = .78), closely followed by Happy Child (M = 3.94, SD = .79). The mean score of Enraged Child was the lowest (M = 1.64, SD= .64). These two modes are the indicators of Adaptive modes. As the students participating in this study were non-clinical sample. Thus, it is appropriate to have highest scores on these two schema modes. Consistently, the previous studies found these two schema modes scored the most in non-clinical sample. For instance, Lobbestael, Van Vreeswijk, Spinhoven, Schouten, and Arntz (2010) found that normal control group had the highest scores in healthy adult and happy child (4.52 and 4.60 respectively). Reiss et al. (2012) also found that normal controls had the highest scores in healthy adult and happy child (4.65 and 4.53 respectively).

2. The validation of measurement model of early maladaptive schemas and schema modes

2.1 The validation of measurement model of early maladaptive schemas

The confirmatory factor analysis supports the validity of EMSs proposed by Young, Klosko, and Weishaar (2003). All of 18 measurement models of EMSs, consisting Abandonment, Mistrust, Emotional Deprivation, Defectiveness, Social Isolation, Dependence, Vulnerability to Harm, Enmeshment, Failure, Entitlement, Insufficient Self-Control, Subjugation, Self-Sacrifice, Approval Seeking, Pessimism, Unrelenting Standard, and Punitiveness, showed good fit with the data. These findings supported factorial validity of EMSs. In addition, the results indicated good convergent validity and discriminant validity of all of 18 EMSs. The findings of this study are similar to previous research. The studies of Hawke and Provencher (2012), Calvete et al. (2012), and Kriston, Schäfer, Jacob, Härter, and Hölzel (2013) consistently found YSQ-3s had good factorial validity.

Regarding the second-order factor structure, the findings do not support the theoretical five second-order model proposed by Young et al. (2003), which is comprised of Disconnection and Rejection domain, Impaired Autonomy and

Performance domain, Impaired Limits domain, Other-Directedness domain, and Overvigilance and Inhibition domain. The results also indicated the poor fit with the data of all alternative models namely, one second-order model, Calvete et al. (2012), Saritaş and Gençöz (2011) Soygüt et al. (2009). The present study is in accord with the previous research investigating factor structure of EMSs in Western countries. Previous research demonstrated the strong evidences supporting factor structure of individual EMSs, whereas evidences supporting second-order factor structure have been mixed (Calvete et al., 2012; Hoffart et al., 2005; Kriston, Schäfer, Von Wolff, Härter, & Hölzel, 2012; Samuel & Ball, 2012; Schmidt, Joiner, Young, & Telch, 1995; Soygüt et al., 2009; Van Vlierberghe, Braet, Bosmans, Rosseel, & Bogels, 2010). In the current study, the four second-order solution was produced.

The author labels the first second-order factor as *Disconnection domain*, consisting of Abandonment, Emotional Deprivation, Mistrust, Social Isolation, Defectiveness and Emotional Inhibition. This domain is very similar to Young et al. (2003)'s Disconnection and Rejection domain, except the Emotion Inhibition. According to Young et al. (2003), the Emotional Inhibition was loaded on Overvigilance domain. However, the previous research consistently reconsidered this EMS to move to Disconnection domain (Calvete et al., 2012; Hoffart et al., 2005; Lee, Taylor, & Dunn, 1999; Saritaş & Gençöz, 2011; Schmidt et al., 1995; Soygüt et al., 2009). Van Genderen, Rijkeboer, and Arntz (2012) stated that people with high emotional inhibition tend to constrain their feelings and actions in order to avoid disapproval or embarrassed by others. Therefore, the content of this EMS involves rejection by other people, which is an attribute of this domain (Calvete et al., 2012; Lee et al., 1999).

The second second-order factor is named *Impaired Autonomy domain*, which is comprised of Failure, Dependence, Vulnerability to Harm, Enmeshment, and Subjugation. The results differ from Young's Impaired Autonomy and Performance domain only in Subjugation, which used to belong to Other Directedness domain. People with high subjugation tend to ignore their own needs, and submit to the control of others in order to avoid negative consequences (Van Genderen et al., 2012; Young et al., 2003). Thus, the content of this EMS involves the characteristic of this domain. Our solution obtained in the current study is consistent

with the previous studies (Calvete et al., 2012; Hoffart et al., 2005; Lee et al., 1999; Saritaş & Gençöz, 2011).

The third second-order factor is labeled *Impaired Limits domain*. Entitlement and Insufficient Self-Control are loaded on this domain. The results correspond with Young's Impaired Limits domain, and are also consistent with the studies of Hoffart et al. (2005) and Soygüt et al. (2009). However, the previous studies (Calvete et al., 2012; Saritaş & Gençöz, 2011)) suggested that Young's Impaired Limits should integrate with Other-Directedness and Overvigilance. Therefore, further investigation involving the factor structure of this domain should be conducted.

The fourth second-order factor is named *Exaggerated Standards domain.* The author labels this domain in accordance with the study of Schmidt et al. (1995). The Unrelenting Standards and Self-Sacrifice load on this domain in the same manner with Hoffart et al. (2005) Lee et al. (1999), and Schmidt et al. (1995). In addition, Young subsequently identified EMSs, including Approval Seeking, Punitiveness, and Pessimism, also load on this domain. These EMSs grouped in this domain share some content of beliefs characterized by over-concern about social values and standards. Individuals with high score of this schema domain tend to emphasize perfection, performance, responsibility, and acceptance. They also overly control their feelings and behaviors due to concerns regarding rules, social standards and others' evaluation. Furthermore, according to the fact that the analysis revealed the highly positive correlation between Other-Directedness domain and Overvigilance and Inhibition domain ($r = .944$), the integration of these two schema domains into Exaggerated Standards domain make the model more parsimonious.

The author found the four second-order model obtained in this study is very similar to the four-second order model proposed by Lee et al. (1999) and Hoffart et al. (2005). In accordance with Kriston et al. (2012), they tested the second order model of YSQ-S3, and found that Lee-Hoffart model showed slightly better fit than other models. It can be concluded that the all of 18 EMSs have good factorial validity, convergent validity, and discriminant validity. Although the results were failed to support Young's second-order model, the four second-order solution is very similar to the findings from previous studies in Western countries. Hence, these results

demonstrate the utility of the YSQ-S3 in Thai college student population. These results also provide further support for the existence of EMSs in Thai context.

2.2 The validation of measurement model of schema modes

According to the confirmatory factor analysis, it indicated that 14 schema modes were confirmed. Moreover, it was found that after certain model respecifications, the models of 14 schema modes demonstrated good discriminant validity and convergent validity. The results of this study correspond to the finding from the studies of Lobbestael et al. (2010) and Reiss et al. (2012), which examined the factor structure of schema modes. The findings of both studies supported factor structure of 14 schema modes. However, the results of the current study found that the second-order model of schema modes was not fit with empirical data. The alternative second-order models from other researchers have not been proposed yet. Thus, the author decided to use exploratory factor analysis in order to investigate underlying second-order factor structure of schema mode. According to the exploratory factor analysis, five second-order solution was produced. This solution achieves both meaningful interpretability of factor structure and acceptable goodness of fit with data. Then, the second-order model from exploratory factor analysis was re-examined using the confirmatory factor analysis.

The first second-order is named *Internalizing mode*, which consists of Vulnerable Child, Compliant Surrender, Detached Protector, Punitive Parent, and Demanding Parent. This second-order mode is characterized by cognition, affection, and behaviors that are turned inward to the self. These may involve depression, anxiety, helplessness, hopelessness, suppression of others negative emotions as well as social withdrawal, surrender to other, and self-blaming. Although the second-order mode does not consistent with the Young et al. (2003)'s theoretical model, the core concept of this second-order mode corresponds to literature reviews and research on emotional states, cognitions and behaviors among adolescents and college students. Previous studies demonstrated that the emotional and behavioral problems among adolescents and college students can be categorized into the same group in accordance with the internalizing nature. It is composed of depression, sorrow, anxiety, insecurity, loneliness, social withdrawal, self-defeating thoughts, and

low self-esteem (Chen et al., 2003; Reitz, Deković, & Meijer, 2005; Rubin, Chen, McDougall, Bowker, & McKinnon, 1995).

The second second-order mode is labels *Overcompensation mode*, which is comprised of Self-Aggrandizer, and Bully and Attack. This mode is characterized by cognition, affection, and behaviors that individuals adopt to respond the threatening situation or environment in extreme way and improper manner. These responses are senses of being superior to others, no consideration for other people, intimidation, or threats towards others in order to prevent them from being controlled or hurt. The exploratory factor revealed that Self-Aggrandizer, and Bully and Attack were loaded on same latent variables. These findings correspond to the previous development of the mode concept. Formerly, Young et al. (2003) had started to develop the concept of schema mode, they did not mention about Self-Aggrandizer, and Bully and Attack. However, these two schema modes are in the same group called the Overcompensator. It is a part of the Maladaptive Coping mode. The preceding Young Atkinson Mode Inventory (YAMI) and Schema Mode Questionnaire (SMQ) also have one part that assessing the Overcompensator. Later, the Overcompensator had been revised and separated from Maladaptive Coping mode. Also, Overcompendator were divided into 2 modes, Self-Aggrandizer, and Bully and Attack for the reason of practice with some groups of patient (Lobbestael, 2012; Lobbestael et al., 2010). After revision, the Self-Aggrandizer mode and Bully and Attack mode were contained into Schema Mode Inventory (SMI) (Lobbestael, 2012; Lobbestael et al., 2010), which was used as a research instrument in the current research. Thus, it can be said that the findings of this study correspond to previous processes of theory development.

The third second-order model is labeled *Adaptive mode*, which comprised Happy Child and Healthy Adult. This mode is characterized by cognition, affection, and behaviors having proper interaction with the certain situation. This second-order mode is utilized when individuals feel love and content. They tend to feel satisfied, respond the situation spontaneously and solve problems appropriately, which make them achieve their goals. At the beginning, Young et al. (2003) distinguished Happy Child from Healthy Adult, but later it was claimed that they should be in the same domain which is an adaptive mode. This concept had been

supported by some scholar like Lobbestael, Van Vreeswijk, and Arntz (2008), who also included Happy Child and Healthy Adult in Adaptive mode. Moreover, Reiss et al. (2012) also categorized these two modes into a same second-order mode named Functional mode. According to the previous research, Happy child and Healthy Adult have a negative relationship with personality disorders (Lobbestael et al., 2008). It also found that the normal control participants had higher scores on these two modes than psychiatric patients (Lobbestael et al., 2010; Reiss et al., 2012). Thus, the finding of this study suggesting that Happy Child and Healthy Adult were consisted in Adaptive mode is consistent with previous research.

The fourth second-order mode is named *Avoidance mode*, consisting of only Detach Self-Soother. This second-order mode is characterized by cognition and behaviors that individuals utilize to avoid negative feeling triggered by situations they are over-sensitive. According to the former concept of Young et al. (2003), Avoidance mode used to be a part of Detached Protector. Later, it was noticed that social withdrawal and isolation differed from self-soother strategies. So, the Detached Self-Soother was separated from Detached Protector since then (Lobbestael, 2012; Lobbestael et al., 2010). Thus, the finding from this research supports that Detached Self-Soother and Detached Protector are different constructs. In addition, the Detached Self-Soother differs from other modes. The findings also support that Detached Protector should be grouped into Internalizing mode as mentioned in the previous part.

The fifth second-order mode is labeled Spoiled Child mode, which comprise Angry Child, Enraged Child, Impulsive Child, and Undisciplined Child. This mode is characterized by cognition, affection, and behaviors that individuals respond to the environment like a spoiled child, such as directly expressing their anger to others, losing their temper and vandalizing objects, getting bored easily, acting impulsively to pursue pleasure regardless of limits or concern for others, being unable to follow the disciplines or plans. The findings are contrary to Young et al. (2003)'s theoretical model. The findings indicated that Vulnerable Child should be excluded from Child mode. It is because Vulnerable Child is characterized negative feelings such as fear, depression, loneliness, and helplessness, which can be considered of an internalizing nature (Van Genderen et al., 2012; Young et al., 2003).

In contrary, the rest of modes in Child mode are characterized by the cognition, affection, and behaviors that are directed toward the external environment (Reitz et al., 2005; Rubin et al., 1995). Even they are in the same child mode but the core concepts are different, so Vulnerable Child is considered to be in the group of Internalizing mode.

As discussed above, all of these findings support that 14 schema modes demonstrates good factor structure, as well as acceptable convergent validity and discriminant validity. These findings support the implement of the SMI which can be utilized with Thai college students. However, the results fail to support Young et al. (2003)'s second-order of schema modes. Therefore, the author utilizes five second-order model of schema modes from the analysis for investigating the mediating role of schema mode of the structural relationship between EMS and alcohol use among college students. Moreover, the findings also indicate that the development and validation the measurement model of SMI should be regarded as an important issue.

3. The validation of structural relationship among early maladaptive schemas, schema modes, and alcohol use

The results indicated that the modified hypothesized model of relationship among EMSs, schema modes, and alcohol use among college students was fit with the empirical data. The EMSs and schema modes could explain the variance of alcohol use, both directly and indirectly, among college students for 12%. However, there was large proportion of remaining variance of alcohol use that EMSs and schema modes could not explain. These findings are consistent with previous literature on college drinking, which document that college drinking is the complex phenomena. There is no single cause or single factor that could fully account for college drinking phenomena. In addition to EMSs and schema modes considered as individual factors, there are other factors responsible for college drinking; for instance, other individual factors, sociocultural factors, environment factors, situational factors. Regarding to the fields of social and behavioral sciences, the effect size found in this study are considered as moderate effect (Cohen, 1992). The magnitude of effect size found from this study is similar to other studies concentrating on personality traits and alcohol use

among college students (e.g., Aaron, 2013; Hittner & Swickert, 2006; Mezquita, Stewart, & Ruipérez, 2010; Sakulsriprasert et al., 2008)

The discussion of the examination of structural relationship among EMSs, schema modes, and alcohol use were divided into 3 parts in accordance with each sub-hypothesis of the current study. They are 1) the association between EMSs and alcohol use among college students, 2) the association between EMSs and schema modes, and 3) The role of schema mode as a mediating factor linking the relationship between EMSs and schema mode.

3.1 The association between early maladaptive schemas and alcohol use among students.

The results partially supported the first sub hypothesis that EMSs are associated with alcohol use among college students. The finding suggested that Disconnect and Rejection domain and Impaired Limits domain were positively associated with alcohol use; Impaired Autonomy and Performance domain had a negative association with alcohol use; Exaggerated Standards domain was no significant associated with alcohol use.

The associations between EMSs and alcohol use found in this study supported the cognitive model which posits that cognitive processes are a vulnerability factor causing on alcohol use. These findings are similar to previous studies investigating the association between cognitive vulnerability and mental health, adjustment, and health behaviors (e.g., Bamber & McMahon, 2008; Dozois, Martin, & Bieling, 2009; Tremblay & Dozois, 2009; Unoka, Tölgyes, & Czobor, 2007; Van Vlierberghe & Braet, 2007).

As described by Young et al. (2003), early maladaptive schema (EMSs) are characterized by a broad, pervasive pattern consisting of memories, emotions, cognitions, and bodily sensation, which determine the relationships of oneself with other. EMSs function as filters through which individuals process the information such as perceiving, interpreting, and predicting the world. This kind of information processing can be referred as associative information processing, which is automatic, implicit, non-conscious, quick and effortless information processing. Its operation bases on the relationship between the present stimulus and previously stored memory. When individuals encounter the stimulus, the salient

features of the stimulus are linked to past experience. Then, the past experience facilitates processing of the present information. The similarity between present stimulus and past encoded stimulus induces associative information processing. The associative information processing operates at preconscious level, thus the individuals usually only aware of its output and not the information used to produce output (Beevers, 2005). Another important characteristic of association information processing is quite stable over time because its operation relies on memories that have been consolidated by repeated experiences. Generally, individuals utilize association information processing as default mode. They tend to make countless automatic decisions and judgments throughout a day (Beevers, 2005). Due to these explanations, the cognitive psychologists use the concept of associative processing to conceptualize certain behaviors, including alcohol use. Stacy and Wiers (2010) explained that if associative processing is operating more, individuals would have less self-control and fail to regulate their affection, increasing a risk of alcohol or other substance use.

It was found from this research that the three out of four schema domains relate to the alcohol use among college students. The Disconnection and Rejection domain and Impaired Limits domain have positive association with alcohol use. The Impaired Autonomy and Performance domain has the negative relationship, whereas Exaggerated Standards domain shows no statistically significant relationship. It can be assumed from this finding that although the all schemas are associative system, each schema has different origins. This make people with different schema behave differently in same situation or context. The each schema has specific content related to alcohol use. The relationship between each schema domain and alcohol use will be described as follows.

Disconnection and Rejection domain. It was found that the EMS within Disconnection and Rejection domain has the positive relationship with alcohol use (TE = .132). It indicated that individuals having a high rate in this domain have a greater risk of alcohol use. According to Young et al. (2003), individuals with this schema domain are unable to develop secure and satisfying relationship with others. They tend to over-sensitive of being rejected from surrounding people. When the EMS in this domain is activated by some social situations such as refusal, unacceptance, abandonment and feeling worthless, the individual cannot handle with

those situations appropriately and cannot find a social support. Thus, they are at risk of using alcohol to reduce the negative emotion (Ball, 1998; 2005).

The relationship between this Disconnection and Rejection domain and alcohol use found in this study corresponds to previous studies. As stated by Young et al. (2003), the EMSs in this domain generally developed from detached, cold, rejecting, withholding, unpredictable or abusive family of origin. The study of Goldstein, Flett, and Wekerle (2010) revealed that students with neglected history tend to drink alcohol to cope with depression and anxiety. Additionally, Young et al. (2003) also described that the individual having this high schema domain tends to feel defective. According to the previous studies, any individual who has low implicit self-esteem has a tendency to drink alcohol in order to reduce the negative feeling from being unacceptable (DeHart, Tennen, Armeli, Todd, & Affleck, 2008; DeHart, Tennen, Armeli, Todd, & Mohr, 2009).

Impaired Limits domain. The results demonstrated that Impaired Limits domain had the positive relationship with alcohol use (TE = .221). According to this fact, it connoted that individuals with a high level of this schema domain has a high tendency of drinking alcohol. From the concept described by Young et al. (2003), individuals with a high level of this schema domain have difficulty controlling themselves. They tend to make a decision impulsively and carelessly. Moreover, they have poor self-discipline, resulting in unable to follow the plans as well as ignore the rules or regulations. Thus, individuals with a high level of this schema domain tend to drink alcohol with their friends for fun or excitement without realizing about the negative consequences. Besides, they have low frustration tolerance. Therefore, they cannot deal with the stress, anger and frustration. Consequently, they are at the higher risk of drinking heavily in order to cope with negative emotions.

According to the literature reviews, although the number of studies focusing on the relationship between EMSs and the alcohol use of college students were limited, the results of this study are consistent with the previous studied using clinical sample, such as the studies of Shorey, Stuart, and Anderson (2012) and Shorey, Stuart, and Anderson (2013). Those two studies found that the EMS of Insufficient Self-Control of patients with alcohol use disorder was higher than male

and female college students. It showed that the difference has the largest effect size comparing to other EMSs (d = 1.51 and 1.17 respectively).

With regards to college population, theme of the results of the current study matches with the content from several studies focusing on alcohol use among college students. They indicated that high impulsive and low self-control had significantly positive relationship with alcohol and substance use. For instance, Stautz and Cooper (2013) conducted a meta-analysis of 87 studies in order to find the relationship between impulsivity-related personality and alcohol use among college students. They found that sensation seeking and positive urgency/reward sensitivity have a moderate relationship (r = .28 and .27 respectively). Hittner and Swickert (2006) presented similar findings of meta-analytic study of 61 studies. It was found that disinhibition had moderate effect of relationship with alcohol use and alcohol-related problems (r = .26 and .37).

Impaired Autonomy and Performance domain. The findings of the current study, unexpectedly, found that Impaired Autonomy and Performance domain had a negative association with alcohol use (TE = -.295). It conveys that individuals with high Impaired Autonomy and Performance have low risks of alcohol use. This finding is opposed to Young et al. (2003) and S. Ball (2004)'s proposition, which stated that individuals who have this domain in a high level do not believe in their ability in decision making. They usually perceive themselves incompetent, dependent, unable to handle everyday responsibilities without others, and submitted to the control from others. Thus, when encountering social pressure, they are unable to refuse drinking opportunities. They are also more likely to drink alcohol to conform to their peers. On the contrary, the results of present study suggest the significant negative association between this domain and alcohol use. One possible explanation is that the samples of this study are non-clinical. The scores of EMSs within this domain are not high as clinical groups. So, this findings are not support the propositions of Young et al. (2003) and S. Ball (2004) which were grounded on their clinical experiences.

However, the findings from the current study are compatible with other studies focusing on college student population. Loxton, Bunker, Dingle, and Wong (2015) found that drinking due to conformity motive had the negative

relationship with alcohol use among college students (β = -.28). It is consistent with the study of Graziano, Bina, Giannotta, and Ciairano (2012), which examined drinking behaviors of Italian adolescents. The results revealed that drinking due to conformity motive had the negative relationship with the drunkenness (β = -.11). It is similar to Lyvers, Hasking, Hani, Rhodes, and Trew (2010)'s findings. They found that drinking from conformity motive had the negative relationship with the amount of alcohol use which β was -.15 and showed no significant relationship with alcohol-related problems (β = -.07) and alcohol dependence (β = -.05). Nonetheless, Ham, Bonin, and Hope (2007) and Eggleston, Woolaway-Bickel, and Schmidt (2004) also additionally elaborated that drinking alcohol is a social gathering activity. The college students who lack of self-confidence and has social anxiety may decide to abstain from alcohol because of concerns about negative evaluation for disinhibited behaviors while intoxication. In addition, they might intentionally avoid drinking situations in college setting (e.g., parties) due to these situations are social situation. In regards to the finding of the current study, the characteristics of Impaired Autonomy and Performance domain are very similar to the characteristic of people with low self-confidence and social anxiety documented in previous studies (dependence on others, inadequate feeling, suppression of own desires, and incapability of refusing others). Hence, the current study's findings are supported by previous studies.

In addition, this schema domain is composed of Vulnerability to Harm and Illness. Individuals with this EMS believe that danger and accident can happen to him and he cannot deal with those situations (Van Genderen et al., 2012; Young et al., 2003). Consequently, these individuals tend to avoid risky situation such as drinking alcohol heavily which could cause accidents or quarrels.

Exaggerated Standards domain. Compared to Young et al. (2003), this domain is the combination of Other-Directedness domain and Over-Vigilance and Inhibition domain except the Emotional Inhibition and Subjugation. Young et al. (2003) and Ball (2004) proposed that these two schema domains have a positive relationship with alcohol use in terms of drinking for reducing negative emotions and stress from the excessive focus on the need of other and high internalized standards. Surprisingly, this study found that this domain was not significantly associated with alcohol use (TE = .004). However, the findings of this

research correspond to previous studies. According to Shorey et al. (2012) who compared EMSs of female patients with alcohol dependence to non-clinical female college students, they indicated that there were no significant difference between Unrelenting Standards and Self-Sacrifice. These two EMSs belong under the Exaggerated Standards domain. Similarly, Shorey et al. (2013), who compared the EMSs of male patients with alcohol dependence to non-clinical male college students, found that five out of 18 EMSs showed no statistical difference between patient group and control group. Among these five EMSs, four of them were the EMSs within this domain, namely Unrelenting Standards, Self-Sacrifice, Approval Seeking and Punitiveness. Shorey et al. (2012, 2013) discussed that the reasons why there were no significant differences of these EMSs between patients with alcohol dependence and non-clinical control. They pointed out that college students need to set high standards and goals in order to be successful in studying or working. Although these EMSs of the students are high, they are less likely to drink alcohol if they can achieve their goals. However, in regards to patients with alcohol use disorder, they tend to set their standards very high but experiencing the achievement towards their goals less. Thus, the patients undergo the failure and negative emotion more and have greater risk of alcohol use than students.

A discussion of Shorey et al. (2012, 2013) is consistent with the concept of developmental psychology concentrating on the college students. Arnett (2000) pointed out the developmental tasks of college students that the enrollment at a college or university is a crucial transitional period from adolescence to adulthood. The students explore and formulate their identities, involving work and love. With regard to work dimension, the college students realize the important of future. They have the more serious on work and study related to their future occupations. For love dimension, they need the acceptance from their partners, friends, significant others, and surrounding people. To accomplish the developmental tasks, the students inevitably set their goals and commit to them. Subsequently, they have consistently and seriously made progress on them. In addition, whereas the intimacy relationships in adolescence are more likely to be tentative and transient, the intimacy relationships in college students tend to involve deeper level. As mentioned, the findings of current study that the score of EMSs within Exaggerated Standards domain are higher than

other EMSs correspond with the developmental stage of college students. (Unrelenting Standards = 3.54, Self-Sacrifice = 3.58, Approval Seeking = 3.30 and Punitiveness = 3.36. In the meantime, the mean score of other EMSs are between 1.94 and 2.82). All college students, whether drinking alcohol or not, have to step over the developmental task to reach the standards in terms of work and love (Correia, Murphy, & Barnett, 2012; Schulenberg & Maggs, 2002). Therefore, Exaggerated Standards domain has no significant association with alcohol use. Alternatively, it is possible that this schema domain showed insignificant relationship with alcohol use because of the impression management. Due to the need for success and approval, the college students tends to maintain their good images by providing socially desirable answers (Rijkeboer, 2012; Shorey et al., 2012).

3.2 The association between EMSs and schema modes

The findings support second sub hypothesis that each schema domain has a specific relationship with schema modes. First, Disconnection and Rejection domain had the direct effects on Internalizing modes and Adaptive mode. Furthermore, this domain was indirectly related to Avoidance mode, Spoiled Child mode and Overcompensation mode. Second, Impaired Autonomy and Performance domain had the significant direct effect on Avoidance mode. The associations with other modes were not found with statistical significance. Third, Impaired Limits domain had the significant direct effect on Avoidance mode, Spoiled Child mode, Overcompensation mode, and Adaptive mode. Finally, Exaggerated Standards domain was directly related to Internalizing mode. Also, this domain had the significant indirect effects on Spoiled Child mode, Overcompensation mode and Avoidance mode. The results from this study correspond with Young et al. (2003)'s theoretical explanation that schema modes are operated when an EMS is activated from any situation that individuals are over-sensitive. When activated, the EMS drives the individual to utilize coping responses or have any emotional states. These responses to any given situation can refer as schema modes (Van Genderen et al., 2012; Young et al., 2003). So, in the other words, behaviors and feelings are not part of EMSs, but they are the responses to schema activation. These responses could be referred as schema modes. It can be concluded that EMSs function schema content and schema modes function as schema processes. Theoretically, EMSs refer to the cause, and

schema modes refer to the effect from the EMSs. It can be also described that the EMS is a schema content while the schema mode is a schema process, resulted from one or more EMS activated in the same time (Van Genderen et al., 2012; Young et al., 2003). Hence, EMSs are similar to the trait concept, which explains us about what kind of situation that individuals are over-sensitive. Individuals with different EMSs are influenced by different situations, and tend to have different responses in such situations. These different responses refer to different schema modes. However, the relationship between schema and schema mode is a conceptual framework deriving from case study method and clinical experiences with clinical subjects. It can be claimed that the results of the current study provide the evidence for examining the relationship between EMSs and schema modes in a large college sample. The details of relationship between schema and schema mode are discussed as follows;

Disconnection and Rejection domain. Disconnection and Rejection domain had the statistically significant total effect on schema modes. It had the direct effects on Internalizing modes (TE = .793) and Adaptive mode (TE = -.691). Furthermore, this domain was indirectly related to Avoidance mode (TE = .501), Spoiled Child mode (TE =.327) and Overcompensation mode (TE = .131). At the beginning, the relationship between Disconnection and Rejection domain and Internalizing mode is discussed. Then, the indirect relationships from this schema domain to other schema mode via Internalizing mode are discussed. Finally, the relationship between this schema domain and Adaptive mode is explained.

Disconnection and Rejection domain had the positive direct effect on Internalizing mode. The results indicate that when encountering with any triggered situation, such as an argument with friends or lovers, being rejected, being alone or being in any situation that makes him feel inferior, individuals with this schema domain tend to utilize Internalizing mode. Emotionally, they may feel depressed, worried, lonely and alienated. Cognitively, they tend to have a self-blame or self-criticism. For illustration, a female student with this schema spends less time with their lovers during the assignment submission period and test preparation. She feels alienated, lonely and neglected. She is afraid that her lover will abandon hers and have an intimate relationship with one another. When these feelings are evoked, the individual utilizing the Internalizing mode tend to manage their feelings by using the

other schema modes. According to Young et al. (2003), one schema mode can induce individuals to utilize other schema modes. In this study, it was found that Internalizing mode can contribute to Avoidance mode, Spoiled Child mode, and Overcompensation mode. In other word, the findings suggested that Internalizing mode is the default mode of individuals with the schema domain.

The Internalizing mode had the positive direct effect on Avoidance mode (TE = .632), indicating that high Internalizing mode leads to high Avoidance mode. When individuals have negative emotions from EMSs triggered, they adopt Detached Self-Soother to alleviate the negative emotions. For illustration, during the exam period, the female student with high Disconnection and Rejection domain has less time with her lover. She feels lonely and fear of being abandoned from her boyfriend (Internalizing mode). She tries to alleviate with the loneliness and fear in several ways, which could be adaptive and maladaptive, such as exercising, watching movie, sleeping, going shopping, spending money, consuming comfort food, and taking addictive substances to reduce the negative emotions (Van Genderen et al., 2012; Young et al., 2003).

The Internalizing mode had the positive influence on Spoiled Child mode (TE = .413). The study showed that Internalizing mode can flip into Spoiled Child mode. The Young et al. (2003)'s theoretical model explained that Detached Protector and Punitive Parent, which are the indicators of Internalizing mode, operate to keep most of the individuals' needs and feeling suppressed. Subsequently, the suppressed needs and feelings accumulate, and the individuals feel a growing sense of inner pressure. When they cannot hold back anymore, they flip into Angry Child or Enraged Child. They tend to express their anger and irritability in inappropriate ways. Also, they could flip into Impulsive Child and Undisciplined Child. They act impulsively and recklessly to meet their needs. The underlying emotions of these reactions are depression, loneliness and feelings of being rejected and abandoned from EMS activated. For illustration, during the exam period, the female student with high Disconnection and Rejection domain feels depressed and lonely due to less time with her partner. After a while, the loneliness turns outward into anger. The student displays her anger out of control. She has a quarrel with her

partner, throws things in her room, and speaks sarcastically and acts without realizing the consequences.

The Internalizing mode had the direct effect on Overcompensation mode (TE = .426). The results suggested that when EMSs within Disconnection and Rejection domain were activated, the individuals can feel overwhelmed with negative emotion such as depress, hopeless, vulnerable. They might try to cope with these negative emotions by fighting back or controlling the situation in order to receive an acceptance or love from their friends, partners, or significant ones. They use power to threaten or force others not to leave him, and they minimize the value of significant others who leaves him. For illustration, when the female student with EMSs within Disconnection and Rejection domain feels isolated or lonely because her partner cannot spend time with hers during the exam period. Also, she is afraid that her partner may abandon hers. To control this unwanted situation, she may force her partner spend more time with hers, compel her partner not to do group assignments with his classmates, disturb or annoy friends of her partner or speak sarcastically. It includes doing anything that praises the value for herself such as start talking with other persons whom she is interested, underestimate or devalue her partner, etc. All these excessive or inappropriate reactions correspond to Self-Aggrandizer and Bully and Attack which is in Overcompensation mode (Young et al., 2003). Besides, the study of Shorey, Elmquist, Anderson, and Stuart (2015) supported the findings of this study in a way that Disconnection and Rejection domain has a positive relationship with the physical aggression among male patients with substance use disorder.

The Disconnection and Rejection domain had a negative influence on Adaptive mode (TE = -.691) which showed that when this schema domain is triggered, individuals tend to utilize Adaptive mode less. The findings from this study correspond to Young et al. (2003)'s theoretical model. To clarify, Adaptive mode is characterized by positive emotions such as happy, satisfied, loved and contented. Additionally, it includes the coping responses, namely having consciousness, being careful and being able to solve the problem appropriately. The characteristic of this mode is different from characteristic of Disconnection and Rejection domain when activated. Thus, individuals with high Disconnection and

Rejection domain tends to adopt less Adaptive mode. Furthermore, the empirical research of Lyrakos (2014) indicated the similar finding that is Happy Child and Healthy Adults have the negative relationship with EMSs belonging to Disconnection and Rejection domain.

The Impaired Autonomy and Performance domain. The result of the current study showed that Impaired Autonomy and Performance domain was negatively associated with Avoidance mode (TE = -.422). There was no significant relationship with the other modes. It pointed out that individuals with high Impaired Autonomy and Performance domain tend to use avoidance coping responses less. The possible explanation is individuals with this scheme domain are likely to have low self-esteem and self-confidence. When encountering with problems, they generally believe that they cannot handle them effectively (Van Genderen et al., 2012; Young et al., 2003). Thus, they are more prone to be dependent and seek social support. They usually ask others for help rather than solving the problem on their own. Besides, the samples of this study are non-clinical, so EMSs are not too high. The dependent behaviors do not reach a pathological dependence. On the contrary, among clinical population like patients with substance use disorder or patient with personality disorders, their dependent behaviors tend to be more severe and pathological, which caused the relationship problem with surrounding people who can feel unsatisfied or annoying and eventually give no help. So, without helping form other, patients with this schema domain use alcohol or substance to reduce negative emotions (Beck, Wright, Newman, & Liese, 1993).

Impaired Limits domain: It was found that the Impaired Limits domain had the positive direct effects on Spoiled Child mode (TE = .387), Overcompensation mode (TE = .540), Avoidance mode (TE = .430), and Adaptive mode (TE = .359). The relationship can be described as follows;

Impaired Limits domain had the positive direct effect on Spoiled Child mode. Individuals with this schema domain have not adequate internal limits. They have difficulty controlling themselves and have low frustration tolerance (Young et al., 2003). When this schema domain is activated; for example, a male college student with high level of this schema domain has to do detailed tasks or assignment, which require more time and effort to finish. This kind of situation

triggers his schema domain. The student feels boring, angry and unsatisfied towards doing routine tasks. He is unable to finish them and then turns to other exciting activities instead such as playing games, hanging out with friends.

Impaired Limits domain had the positive direct effect on Overcompensation mode. This schema is composed of Entitlement. Individuals with a high level of Entitlement believe that they are superior to others such as receiving attention from others and being loved and getting acceptance among friends (Young et al., 2003). When the EMS is triggered by confronting with certain situation such as not receiving the attention or being insulted from friends, the individual tries to react to the situation in order to get acceptance from friends or maintain their own value. The way of reacting to the situation is a part of the Overcompensation mode such as showing aggression to win over others or acting superiorly. The finding from this study is similar to Shorey et al. (2015) who found that Impaired Limits domain had a positive relationship with the verbal and overall aggression.

Impaired limits domain had the positive direct effect on Avoidance mode. When this schema domain is triggered by certain situation such as doing boring routine works, or finding a difficulty in relationship with others, or being intimidated or ignored from others, the individual tends to utilize Avoidance mode by doing some activities, which could be adaptive, such as doing exercises, taking a trip, or maladaptive and risky such driving fast, gambling, drinking alcohol, or taking illicit drugs in order to handle with the boredom, anger and dissatisfaction from the particular situations. Due to the fact that the individual with this schema domain has less internal control, the operations of Avoidance mode are quick and effortless. So the individual does not aware those mentioned emotional states (Van Genderen et al., 2012; Young et al., 2003).

However, it was found that the Impaired Limits domain had the positive direct effect on Adaptive mode (TE = .359). A high Adaptive mode indicates proper problem-solving by being assertive to achieve the goals (Van Genderen et al., 2012; Young et al., 2003). Although individuals with high Impaired Limits domain are impetuous and impulsive, these characteristics are associated with certain positive attributes such as dominant, out-going, expressive, articulate, and self-reliant. For instance, the study of Gullo and Dawe (2008) suggested that even though

impulsivity has many disadvantages, it also has a strength point that is being able to fight against obstacles. It is similar to the study of Van der Linden, Taris, Beckers, and Kindt (2007), which illustrated that in order to be successful or get what one need, sometimes individuals have to take the risk and make a decision. Similarly, the finding from this study revealed that when the variances of Spoiled Child mode and Overcompensation, which indicate negative attribute (e.g., hot-tempered, angry, impulsive and reckless, aggressive, threatening) were partialled out, the remaining variance in Impaired Limits domain is positively related to Adaptive mode.

Exaggerated Standards domain. The results of this study found that the Exaggerated Standards domain had the direct effect on Internalizing mode (TE = .094). Individuals with this schema domain tend to set high standards, performances, and responsibilities. They also overly control their feelings and behaviors due to concerns regarding rules, social standards and others' evaluation. Therefore, they feel guilty easily if they indulge themselves especially when encountering by any situation related to standards and responsibilities. Sometimes, following a standard can cause distress and worried (Van Genderen et al., 2012; Young et al., 2003). Notwithstanding, the total effect of this schema domain on Internalizing mode was small (TE = .087). That is because of the samples of this study are college students which are non-clinical sample having motivation to succeed their goals. The Internalizing mode is used only when they fail to achieve their goals.

3.3 The role of schema mode as a mediating factor linking the relationship between EMSs and schema mode

The findings of the current study partially support the third sub hypothesis that schema modes serve as mediating factor underlying the relationship between EMSs and alcohol use. The results indicated that 3 of 4 schema domains namely Disconnection and Rejection domain, Impaired Limits domain, and Impaired Autonomy and Performance domain were associated with alcohol use among college students. The influences of Disconnection and Rejection domain and Impaired Limits domain on alcohol use were fully mediated by schema modes. Nevertheless, the influence from Impaired Autonomy and Performance domain to alcohol use was partially mediated by schema modes. This domain had both direct effect and indirect effect on alcohol use. For Exaggerated Standards domain, there was no statistically

significant association between this domain and alcohol use. The mediating role of schema modes between EMS and alcohol use can be discussed as follows;

The findings of the current study that schema modes mediated the influences from Disconnection and Rejection domain and Impaired Limits domain to alcohol use are consistent with Young et al. (2003)'s theoretical framework. According to Young et al. (2003), maladaptive behaviors of individuals are not part of EMS, but such behaviors are driven by EMS. When an EMS of individuals is triggered by the given situation they are over-sensitive, they utilize certain schema modes, which are emotional states and coping responses, in order to response with the situation (Van Genderen et al., 2012; Young et al., 2003). Surprisingly, the findings revealed the schema modes partially mediated the relationship between Impaired Autonomy and Performance domain and alcohol use. One possible explanation is that the concepts of schema modes have recently been developed. At that time, Young et al. (2003) stated they had currently identified 10 schema mode. However, there is more schema modes will undoubtedly be identified in the future. After that, more and more schema modes have been identified (Van Genderen et al., 2012). At the time of the current study has been conducted, 14 modes have been researched. Recently, more modes have additionally been proposed and implemented in clinical practice. Notwithstanding, they have not been validated and available in Schema Mode Inventory or other instruments yet. The examples of newly developed modes are Angry Protector, Obsessive Over-Control and Attention Seeking (Lobbestael et al., 2010; Lobbestael et al., 2008; Van Genderen et al., 2012). Furthermore, Van Genderen et al. (2012) noticed that existing of set of schema modes particularly represent externalizing nature. Then they asked scholars to continually extent the knowledge about schema modes in the future.

The five second-order schema modes consist of Spoiled Child mode, Overcompensation mode, Avoidance mode, Internalizing mode, and Adaptive mode. All of them serve a role as a mediating factor of the relationship between EMSs and alcohol use among college students. The influence of the schema modes towards alcohol use can be explained as follows;

Spoiled Child mode. The Spoiled Child mode mediated the relationship from Disconnection and Rejection domain and Impaired Limits domain to

alcohol use. The results of this study showed that the Spoiled Child mode had the positive direct effect on alcohol use (TE = .101), which indicate that the more Spoiled Child individuals use, the more alcohol they will consume. The Spoiled Child mode is characterized by cognition, affection, and behaviors that individuals respond to the environment like a spoiled child, such as directly expressing their anger towards others, losing their temper and vandalizing objects, acting impulsively to pursue pleasure regardless of limits or concern for others. These characteristics are related to alcohol use as described below;

The effects of Angry Child and Enraged Child on alcohol use. From previous study, it was found that feeling of anger and rage is one of factors that lead to alcohol use, including initiation, maintenance, as well as relapse. It is because drinking alcohol is a way to release the unresolved anger and rage which are unable to overcome (Beck et al., 1993; Colby, Colby, & Raymond, 2009; Kersten, 2012; Newman, 2004). Besides, it was found that adolescents who are angry easily tend to affiliate with deviant peers, which could lead to increased alcohol and substance use. (Banducci, Hoffman, Lejuez, & Koenen, 2014; Pardini, Lochman, & Wells, 2004).

The effects of Impulsive Child and Undisciplined Child on alcohol use. Not surprisingly, the findings that Impulsive Child and Undisciplined Child positively affect alcohol use are consistent with the previous literature on college drinking. A number of previous studies indicated that impulsivity-related characteristics such as boredom susceptibility, disinhibition, urgency, low frustration tolerance, reward sensitivity are positively associated with alcohol and substance use. College students with these characteristics are at risk to drink alcohol in order to enhance positive mood and socialize with their peers. Kuntsche and Cooper (2010) found that college students apparently drink large quantities on weekend because they are seeking fun and excitement. Corresponding with the findings of the study of Mezquita et al. (2010), their results showed that undergraduate students with low Conscientiousness tend to drink alcohol in order to enhance positive emotional states. Similar to the study of Adams, Kaiser, Lynam, Charnigo, and Milich (2012), they pointed out that college students with sensation seeking, negative urgency, and lack of premeditation are more likely to use alcohol for elevating positive emotion and

enjoyment, Consequently, those students are at higher risk for alcohol-related problems.

Overcompensation mode. The results demonstrated that Overcompensation mode had the positive direct effect on alcohol use (TE = .327). These results can be interpreted that individuals who use more Overcompensation mode are more likely to have high rate of alcohol use. This mode consists of Self-Aggrandizer, and Bully and Attack. These two modes have the positive relationship with alcohol use as the following discussion;

The effect of Self-Aggrandizer on alcohol use. The Self-Aggrandizer is characterized by the belief and feeling of superior. Individuals with this mode drink alcohol to enhance the self-esteem, self-confidence and sense of superiority. The findings from this study correspond to Kersten (2012), who investigated the relationship between schema modes and substance use among forensic psychiatric patients. The study suggested that alcohol is used as a tool for driving the feeling of superior and powerful. The findings of the current study are also consistent with Colby et al. (2009), who found that when college students drink alcohol, they feel that they are adults. This is because drinking alcohol is a sign of maturity. Considering the social context in Thai society, alcohol is used to convey the superiority, maturity and power as well. For instance, the study of Sherer and Wonguparaj (2007) pointed out that Thai society constructs the meaning of alcohol beverages as signs of adulthood, masculinity and maturity. Similarly, the study of Pongnil and Olanwat (2009) investigated the alcohol use among college students. They found that female students drank alcohol to convey the message that they are courage like a man even they are apprehensive of their danger related to alcohol intoxication and drunkenness.

The effect of Bully and Attack on alcohol use. According to Kersten (2012), Bully and Attack is associated with alcohol and substance use. When individuals utilize Bully and Attack to response the threatening situation, they show aggression, intimidation, or threats towards others in order to prevent them from being controlled or hurt. Thus, they tend to use alcohol or other substance for increasing aggression and decreasing anxiety of intimidating others. Correspondingly, Beck et al. (1993) conceptualized that patients use alcohol to several reasons. One of them is to

increase power and aggression. By acting in an aggressive manner, the patients are able to neutralize the sense of powerless activated from the core belief of "I am helpless." The expression of hostility shifts the self-concept form "I am helpless" to "I do have power." Pongnil and Olanwat (2009) also described that alcohol use among college students relates to aggressive behaviors. The case study is at risk to use alcohol if he/she is in the negative emotional states such as angry or lonely.

Avoidance mode. The results show that Avoidance mode had the positive direct effect on alcohol use (TE = .102). Avoidance mode is characterized by the coping responses that individuals adopt to alleviate a negative feeling triggered by situations they are over-sensitive. They tend to do certain activity to sooth themselves such as fast driving, shopping, watching a movie, etc. Due to anxiolytic properties of alcohol, the individuals using Avoidance mode tend to drink alcohol to relieve their stress and negative emotion. The results of this study corresponds to Young et al. (2003) and Ball (2004, 2012), which stated that alcohol and substance use can be considered as an avoidance coping response. When an EMS is triggered, individuals drink alcohol to lessen the negative emotion. Kersten (2012) also stated that individuals use alcohol as avoidance coping response for filling emptiness, loneliness, and feelings of inferiority.

According to the literature on college drinking, numerous studies consistently found that indicated that one important reason of drinking among college students is to cope with negative emotion and relieve tension; for instance the studies of Stewart, Loughlin, and Rhyno (2001), Kuntsche, Knibbe, Gmel, and Engels (2005), , Goldstein et al. (2010), Lyvers et al. (2010), Adams et al. (2012), Graziano et al. (2012), LaBrie, Ehret, Hummer, and Prenovost (2012), Lindgren, Neighbors, Wiers, Gasser, and Teachman (2015). Similarly, the socially meaning of alcohol in Thai context is defined as a way to forget a problem and relieve stress and depression (Sherer & Wonguparaj, 2007). This is similar to Pongnil and Olanwat (2009), who found that the college students usually asked their friends out for drinking because they need to release their stress, failure, and depression from college situation such as heart-broken, getting low scores or grades, having a quarrel with friends or lovers. Especially, the binge drinking students usually have a high level of stress and dissatisfaction.

Internalizing mode. The total effect of Internalizing mode on alcohol use was .041, which was statistically insignificant. However, if considering the direct and indirect effects, the analysis revealed that direct effect was -.204 and indirect effect is .245. These results imply that after Internalizing mode is utilized, it can be flip into other modes namely Avoidance mode, Spoiled Child mode, and Overcompensation mode. Then, these schema modes lead to the individuals to alcohol use as discussed earlier. In addition, after partialling out the variance between these schema modes and alcohol use, the remaining variance in Internalizing mode was negatively associated with lead to alcohol use. This pattern of relationship can be referred as negative suppressor, which found in structural equation modeling (Massen & Bakker, 2001). This pattern of relationship is defined by the phenomenon that the path coefficient between two variables is low or insignificant. But after controlling other variables or including other variables to the analysis, the path coefficient is strengthened. It can be explained that after partialling out the variance of other modes, the path coefficient between Internalizing mode and alcohol was higher in negative direction. These can be implied that when negative emotions that are a part of Internalizing mode are induced, the individuals utilize certain coping responses and emotional states belonging to other schema modes to deal with the given situation; for instance avoidance, anger, intimidation, aggression, overcompensation. All of these coping responses and emotional state lead to alcohol use. However, there are remaining coping strategies belonging to Internalizing mode that can prevent them from drinking alcohol. For instance, they withdraw themselves from peers (Detached Protector). From literature reviews, it was found that college students usually drink alcohol with their friends (Pongnil & Olanwat, 2009), whereas patients with alcohol use disorder usually drink alone. Also, they may react to the negative emotions by punish and criticize themselves (Punitive Parent). Additionally, they might set higher standards for themselves, and try to follow them to increase their self-acceptance (Demanding Parent) with make them avoid an improper behavior including alcohol use. However, these mentioned standards are rigid and maladaptive.

Adaptive mode. The results demonstrated that adaptive mode had the negative direct effect on alcohol use (TE = -.144). The results support Young et al. (2003)'s theoretical model, which proposed that Happy Child and Healthy Adult

have a negative relationship with risky or maladaptive behaviors. The Adaptive mode is defined by cognition, affection and behaviors that individuals employ to respond the environment appropriately. The individual with this mode tend to have positive and neutralized thought and feeling about themselves, and feel love and content. Therefore, the operation of Adaptive mode can be referred to a reflective information processing. The reflective information processing is a slow, effortful mode of information processing. Therefore, reflective information processing operates at a conscious level, and involves significantly more intention and awareness than the associative information processing (Beevers, 2005). The reflective information processing make the individuals understand their emotions and cognitions, so they can use their cognitive resource to regulate them appropriately (Beevers, 2005; Dragan, 2015; Gerrard, Gibbons, Houlihan, Stock, & Pomery, 2008). Previous studies found that the reflective information processing was associated with less alcohol use and fewer risky behaviors (e.g.,Armeli, Todd, & Mohr, 2005; Moss & Albery, 2009; Ostafin, Marlatt, & Greenwald, 2008; Wills et al., 2013). According to Young et al. (2003), the Adaptive mode can be built up. Hence, it can be concluded that Adaptive mode may be an important target of intervention for college drinking reduction programs.

Recommendations

Recommendation for theoretical refinement and application

1. In this study, the author examined the measurement model of early maladaptive schemas. The findings support construct validity of 18 EMSs. However, the findings do not support the theoretical five second-order model proposed by Young et al. (2003). All of these findings should be taking into consideration. Because of the factor structure of 18 EMSs were validated by the current study, researchers and clinicians can confidently use scores of each EMS in research and clinical practice. Nevertheless, the findings of the present study and the various results from previous research suggested researchers and clinicians that schema domain scores are insufficient and inappropriate, and hence should be interpreted with caution.

Additionally, the results show the EMSs could be categorized into four-domain model. The ongoing development of schema theory could take this alternative four-domain model obtained from this study into consideration.

2. The current study investigated the measurement model of schema modes. The results indicate that 14 schema modes are confirmed. However, the results fail to confirm the four second-order model of schema modes proposed by Young et al. (2003). Exploratory factor analysis was performed and obtained five second-order solution, consisting of Internalizing mode, Spoiled Child mode, Avoidance mode, Overcompensation mode, and Adaptive mode. Based on the findings of the current study, the author recommends researchers and practitioners to use score of first-order schema modes. Due to a limited number of previous studies focusing on schema modes, there is knowledge gap on schema mode which is a central concept of schema theory needed to be addressed. First, the extension of the existing set of schema modes and the examination of their hierarchical structure might be necessary. Second, further research on other aspects of schema modes is needed in order to shed more light on this subject.

3. The results of this study provide further support for the existence of EMSs and schema mode in Thai context. Thus, this study provides groundwork for practice and facilitates research activities of schema therapy in Thailand. Furthermore, the theoretical relationship among EMSs, schema modes and alcohol among college students are validated. Hence, this research is regarded as a beginning step for using schema theory to conceptualize and study other aspects surrounding college drinking phenomena.

4. As evident in extensive research, Young's schema theory has been used to conceptualize and treat several health and mental health problems; for instance, marital problems, disordered eating behaviors and obesity, happiness in workplace, humor as well as chronic illnesses. For further research, the schema theory could be integrated into research for conceptualizing various target aspects of physical and mental health in Thai society.

Recommendation for practical implication

1. The results of this study show that EMSs have the influences on alcohol use among college students. Disconnection and Rejection domain and Impaired Limits domain have the positive effect on alcohol use, whereas Impaired Autonomy and Performance domain has the negative effect on alcohol use. These schemas may contribute to the onset and maintenance of alcohol use. For indicated prevention, the integration of schema theory into prevention program for high-risk students may results in improved outcome. For instance, assessing and determining the specific EMS of individuals could help the practitioners to develop a tailored treatment plan and intervention to their specific needs. Moreover, some techniques from schema theory can be adopted to reduce drinking problems among college students; for example, *cognitive strategies* such as testing the validity of an EMS, reframing the evidence supporting an EMS, *behavioral strategies* such as relaxation techniques, anger management, *experiential strategies* such as imagery techniques, chair work.

Furthermore, for selective prevention program, the information of risk situations relevant to Disconnection and Rejection domain and Impaired Limits domain; for instance, breaking up with lovers, having an argument with friends, boredom in working or studying, feeling of being insulted, could be provided to target population in order to promote awareness of high-risk situations and reduce of binge drinking.

For universal prevention, the findings of this study can be integrated into environmental intervention. For example, the findings of this study suggest that Exaggerated Standards domain had the negative association with alcohol use among college student. It could be implied that, consistent with previous study (e.g, Colby et al., 2009), students who believe that college provides an opportunity to freely enjoy life are at risk of heavy drinking. The perceived important of studying in college, perceived college challenging and demands, as well as helping students to set their life goals can be add to implemented environmental strategies such as demand and supply reduction strategies in order to decrease risk for heavy drinking.

2. The findings of this study show that mediating role of schema modes underlying the relationship between EMS and alcohol use among college students. These findings unfold of pathway between EMS and alcohol use and increase

understanding of the complexity of alcohol use within each individual. Although the individuals drinks alcohol regularly, the reasons for drinking are different, depending on various emotional states and surrounding contexts, such as the individuals with Disconnection and Rejection domain tends to drink alcohol to alleviate depression, helplessness, and resentment, to enhance the fun and enjoyment, to increase their self-esteem and self-confidence, or to increase their power for controlling the interpersonal relationship problems. Identifying and modifying the EMS may take time; therefore, schema mode work can be introduced to the target population for strengthening adaptive coping responses and capability to handle negative emotions. This schema mode work might be very useful as a short-term process of reducing the rate of alcohol use. Subsequently, the long-term goal of changing dysfunctional behavioral pattern in accord with the EMS is addressed.

Additionally, in the case of individuals with several EMSs or more severe EMS, they can be easily triggered in several situations. Moreover, in a situation, more than one EMS is triggered in the same time. It is difficult to work with a complexity of simultaneously active EMSs. It is more appropriate for practitioners to apply a schema mode approach to deal with the individuals (Young et al., 2003). In terms of alcohol use, the college students with several EMSs are easily triggered by many situations. So, they tend to drink alcohol frequently and heavily. The practitioner might shift from a EMS approach to mode approach to break through their drinking problems.

3. The findings indicated that Adaptive mode had the negative effect on alcohol use. The more Adaptive mode is utilized, the less alcohol use and fewer risky behaviors are presented. Thus, Adaptive mode is an important target of intervention for college drinking reduction programs.

4. It was found that each schema domain has a specific relationship with schema modes. Therefore, these findings are useful for any research or program in other aspects or issues in addition to alcohol use.

Limitations

The generalization and implication of these findings must be done with caution because of certain limitations.

1. This study is a cross-sectional design that limits the ability to draw causal inference, especially in terms of direction (Bollen, 1989; Schumacker & Lomax, 2010). Therefore, longitudinal or experimental studies are needed to help address the causality among these variables.

2. The EMS and schema modes assessment in this study was solely based on self-report. The drawback of self-repost method is the potential recall bias, which could threat to the internal validity of the research. Moreover, according to Young et al. (2003), the multiple methods should be used for increasing the accuracy of EMS identification. The items of YSQ-3s might activate an EMS of respondents, resulting in the inconsistent information due to schema avoidance or overcompensation. For schema modes, it is hard to use self-repost for measuring the existing schema modes as state concept, which is the emotional state and coping response presented *at the moment to moment* (Lobbestael, 2012). Further research with different methods to assess an EMS and schema mode, such as semi-structure interview or therapist rating, ecological momentary assessment, should be conducted for investigating hierarchical structure of EMS and schema modes.

3. The participants of the current study were non-clinical sample, which limits the generalizability of the finding to clinical population. Although Young et al. (2003) assumes an EMS and schema mode as a continuum from normal to disorder, it is necessary to replicate this study in clinical sample.

4. Although cluster random sampling was applied in the current study, certain ethical issues in research involving human subject has been a matter of concern. The informed-consent process was carried out in order to ensure that the samples are voluntarily to participate in the study with full knowledge of potential risks and benefits. Participants' rights to decline to participate and to withdraw from the research once it has stated are followed. Data collection was conducted at a time convenient to participants for avoiding any coercion and minimizing the disruption of their lectures and activities. All of these ethical considerations result in potential volunteer sampling bias, which may threat to the external validity of the study.

However, the proportion of demographic data and drinking behaviors of the sample in this study is similar to statistical information from Office of the Higher Education Commisson (2015) and previous studies as mentioned earlier.

Despite these limitations, the current study has several strengths.

1. Although previous research documented the application of schema theory to conceptualize the behaviors and some psychological attributes of a non-clinic sample, it was found that the study of relationship between EMS and alcohol use of college student is limited. On the other hand, to our knowledge, this is the first study with large sample size to examine the relationship between EMS and alcohol use among college students.

2. A number of studies focusing on both schema content and schema process are limited. There are also few studies examining schema process, most of them are restricted to eating disorders. The study is the first study that applies both constructs to conceptualize college drinking phenomena, and also the first study that investigates structural relationship among them.

3. In the terms of the examination of mediating role of schema modes, structural equation modeling was performed, which is more effective and accurate than traditional mediation analysis such as regression-based mediation analysis.

4. This study is the first study validating schema theory in Thai context, both measurement model and the structural relationship with alcohol use. The findings of this study can fill the gap of knowledge on college drinking and is regarded as the starting point applying schema theory to grasp more understanding of college drinking phenomena, which could help the practitioners to develop an intervention for college drinking reduction.

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