Storm and Stress: An Investigation of Adolescents' Use of Behavioral and Cognitive

Emotion Regulation Strategies and Their Engagement in Risky Behaviors

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Abstract

The current study investigates the relationship between adolescents' use of adaptive and maladaptive behavioral (i.e., talking to a friend or bullying others) and cognitive (i.e., planning what can be done better the next time, or dwelling on one's thoughts and feelings) emotion regulation strategies following the experience of a negative event and their engagement in risky behaviors. Seventy-eight adolescents from six Montreal inner-city high schools completed the Regulation of Emotions Questionnaire (REQ-2; Phillips & Power, 2007), the Cognitive Regulation of Emotions Questionnaire (CERQ; Garnefski, Kraaij, & Spinhoven, 2002), and the Risky Behaviors Questionnaire for Adolescents (RBQ-A; Auerbach, & Abela, 2008). Results indicate that although adolescents are more likely to use behavioral than cognitive emotion regulation strategies in response to a negative event, the use of adaptive cognitive strategies is associated with a lower incidence of engagement in risky behaviors; whereas, the use of maladaptive behavioral and cognitive strategies are related to an increase in adolescents' risky behaviors. However, contrary to our hypothesis, adolescents' use of adaptive behavioral strategies is not related to adolescents' engagement in risky behaviors.

Résumé

L'étude actuelle examine la relation entre l'utilisation des stratégies adaptives et non-adaptives de régulation des émotions comportementales (parler à un ami ou intimider les autres) et cognitives (planifier mieux faire la prochaine fois, ou ne cesser pas de penser à l'évènement) des adolescents suite à un événement négatif et leur engagement dans des comportements à risque. 78 adolescents de six école secondaire à Montréal ont complété le questionnaire de régulation des émotions (REQ-2; Phillips & Power, 2007), le questionnaire de régulation cognitive des émotions (CERQ; Garnefski, Kraaij, & Spinhoven, 2002), et le questionnaire des comportements à risque pour les adolescents (RBQ-A; Auerbach, & Abela, 2008). Les résultats indiquent que, bien que les adolescents sont plus susceptibles d'utiliser des stratégies comportementales que des stratégies cognitives de régulation des émotions, l'utilisation de stratégies adaptives cognitives est associée à une diminution des comportements à risque, tandis que, l'utilisation à la fois des stratégies non-adaptives comportementales et cognitives est liée à une augmentation chez les adolescents des comportements à risque. De façon inattendue, l'utilisation de stratégies adaptatives comportementales n'est pas liée à l'engagement des adolescents dans les comportements à risque.

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Introduction

Adolescence is a period of development accompanied by physical, psychological, and social transformations and stressors that elicit experiences of heightened emotional arousal (Arnett, 1999; Hall, 1904; Macklem, 2008; Silk, Steinberg, & Morris, 2003). Despite experiencing more frequent and intense emotions than younger children and older adults (Arnett, 1999; Larson, Csikszentmihalyi, & Graef, 1980; Silk et al. 2003), adolescents do not possess adequate cognitive skills to regulate their emotions effectively (Macklem, 2008; Steinberg, 2005; Zeman, Cassano, Perry-Parish, & Stegall, 2006). As a result, many adolescents turn to alternative forms of behaviors that provide a rapid decrease in negative emotions, such as engaging in risky behaviors (Auerbach, Claro, Abela, Zhu, & Yao, 2010; Cooper, Agocha, & Sheldon, 2000; Hessler & Katz, 2009; Mikolajczak, Petrides, & Hurry, 2009).

Although many studies describe the relationship between cognitive emotion regulation strategies and risky behaviors, adolescents' use of behavioral strategies in regulating one's emotions following the experience of a negative event and engaging in subsequent risky behaviors remains unexplored.

The current study examines the relationship between adolescents' use of emotion regulation strategies used in response to a negative or stressful event and engagement in risky behaviors. Specifically, the goal of this study is to examine adolescents' use of cognitive emotion regulation strategies and behavioral emotion regulation strategies. In addition, the present study aims to identify the maladaptive strategies that increase adolescents' engagement in risky behaviors as well as the adaptive strategies that reduce the likelihood of such behaviors.

The following sections will first describe emotion regulation and risky behaviors. Next, the theory and review of the literature connecting emotion regulation and risky behaviors will be summarized.

Emotion Regulation

There are several definitions of emotion regulation employed in the literature. According to Thompson (1994), emotion regulation is "the extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions to accomplish one's goals" (p. 27). More specifically, emotion regulation targets the intensive and temporal features of an emotion by either enhancing or subduing the intensity of the experienced emotion (Thompson, 1994). Furthermore, emotion regulation consists not only of the acquired strategies but also of the external influences and interventions of others (Thompson, 1994).

Some researchers have focused on the lability of emotions (Bridges, Denham, & Ganiban, 2004). More specifically, these researchers measure individuals' sudden changes in affect. Others have examined the intensity of emotions that individuals display (Bridges et al. 2004). Although lability and intensity of emotion are important to the study of affect, using these definitions to measure emotion regulation is not informative when we are interested in knowing what individuals do in response to negative or stressful situations that give rise to negative emotions. Moreover, Thompson's definition (1994) acknowledges that individuals acquire and possess strategies to regulate their emotions; however, individuals also use external or social resources. Accordingly, Thompson's definition (1994) reflects the goals of the current study and will be used to operationalize and in choosing the appropriate measures of emotion regulation.

Development of emotion regulation. The ability to regulate one's emotions develops from birth into adulthood. According to Bell and McBride (2010), the cognitive structures involved in the regulation of emotions are among the last to mature in the developing brain. As children grow older, their repertoire of emotion regulation strategies shifts from external, behavioral strategies to more complex internal, cognitive strategies (Garnefski, Rieffe, Jellesma, Terwogt, & Kraaij, 2007).

Emotion regulation skills emerge shortly after birth. Infants calm themselves by sucking their thumb or an object and looking away from whatever is upsetting them (Macklem, 2008). From eight to ten months of age, changes occur in the prefrontal cortex that makes the process of emotion regulation easier for the child (Macklem, 2008). According to Macklem (2008), it is during the first two years of life, the child learns strategies to cope with their emotions through modeling and explicit teaching by their parents and caregivers.

In the preschool years, from ages three to six, children acquire internal and external strategies by becoming more independent from their caregivers (Macklem, 2008). Also at this time children learn that their expressed emotion does not always need to match how they are actually feeling (Zeman, et al., 2006). The display rules for emotions are the informal rules set by society about displaying emotions, which guide an individual's decision to alter their emotional behavior to meet the social context (Zeman et al., 2006). For example, boys learn that it is not socially acceptable for them to cry in public. Generally, children learn that they can exaggerate, minimize, substitute, and neutralize their emotions depending on the social context (Zeman et al. 2006). According to Zeman and Garber (1996), children's understanding and use of display rules increases

with development. A study conducted by Zeman and Garber (1996) found that fifth

graders used display rules with more frequency and facility than first graders. Thus, as

children develop, they become better able to modify and regulate their emotions.

Once they reach adolescence, individuals become aware of the interpersonal

consequences for inappropriately displaying emotions (Zeman et al., 2006). Thus, the

use of emotion regulation strategies becomes more flexible depending on the individuals'

motivation, the emotion being expressed, and the socio-contextual factors (Zeman et al.,

2006). Also during this period there is a shift from the use of behavioral to cognitive

emotion regulation strategies (Garnefski et al., 2007; Phillips & Power, 2007).

Emotion regulation strategies. Individuals employ a number of strategies in

order to assist them in regulating their emotions following the experience of a negative

event. The strategies most commonly used can be classified into two categories: a)

adaptive strategies, and b) maladaptive strategies. Although majority of the literature in

the field discusses the cognitive strategies that individuals use in response to a negative

event, it is also common for adolescents to employ behavioral strategies in such

circumstances. Moreover, both categories of strategies can be considered to be either

adaptive and or maladaptive.

Adaptive strategies. Individuals can employ adaptive emotion regulation

strategies to help cope with the experience of a negative event. Adaptive strategies are

flexible and context-sensitive (Werner & Gross, 2009). More specifically, individuals

have a repertoire of strategies and they must select which one will be most successful in

achieving their goal (i.e., reducing negative affect) and is most appropriate for their

current situation and setting. In general, these strategies help individuals to accept,

process, and to effectively modulate the experience of negative emotions (Gratz &

Roemer, 2004). The use of adaptive strategies is associated with optimism, self-esteem,

life satisfaction and is also negatively related to feelings of anxiety (Carver, Scheier, &

Weintraub, 1989; Garnefski, Kraaij, Spinhoven, 2001; Gross & John, 2003).

     Maladaptive strategies. On the other hand, maladaptive emotion regulation

strategies can also be used following the experience of a negative experience. Although

some behavioral maladaptive strategies, such as self-harm lead to can decrease the

experience of negative emotions following a stressful experience, a majority of

maladaptive strategies are not effective at reducing negative emotions. Rather, their

usage often results in the amplification of emotional distress instead of a reduction of

negative affect (Werner & Gross, 2009). Often, the use of these strategies generates

secondary emotions by making people feel increased anxiety or distress about their initial

reaction to the incident (Phillips & Power, 2007; Werner & Gross, 2009).

     The use of maladaptive strategies negatively predicts well-being (Gross & John,

2003). For example, levels of stress are predicted by the use of maladaptive strategies

such as rumination and self-blame (Martin & Dahlen, 2005). Individuals who rely on

these strategies also experience high levels of depressive and anxious symptoms

(Garfenski et al., 2001; Legerstee, Garnefski, Verhulst, & Utens, 2011; Silk et al., 2003).

Legerstee and colleagues (2001) compared the use of cognitive coping strategies in

adolescents with an anxiety disorder and those without and found that adolescents with

an anxiety disorder were more likely to use maladaptive emotion regulation strategies

including rumination, self-blame, and catastrophizing. Use of such strategies has also

been linked to increased engagement in risky behaviors (Auerbach et al., 2010; Hessler &

Katz, 2010; Silk et al., 2003).

  Cognitive emotion regulation strategies. A majority of the literature on emotion regulation focuses on individuals' use of cognitive strategies. Specifically, cognitive emotion regulation strategies are the thoughts employed in response to a negative event in order to manage the intake of emotionally arousing information (Garnefski et al., 2001). The use of cognitive strategies increases with development (Phillips & Power, 2007). Individuals use adaptive and maladaptive cognitive strategies in attempts to reduce the experience of negative emotions.

  Adaptive cognitive emotion regulation strategies. According to Garnefski, Kraaij and Spinhoven (2001), there are five adaptive cognitive emotion regulation strategies including: (a) acceptance, (b) refocusing on planning, (c) positive refocusing, (d) positive reappraisal, and (e) putting into perspective.

  Four of the five adaptive cognition emotion regulation strategies have been found to be helpful in both the short and long-term. Acceptance refers to thoughts of accepting what the individual has experienced (Garnefski et al., 2001). When using this strategy, the individual understands that what has happened cannot be changed and acknowledges that life has to go on (Garnesfki et al., 2001). Refocusing on planning refers to thinking about what steps to take in order to deal with the negative event (Garnefski et al., 2001). Although the individual is thinking about the steps to take in order to make changes to their current predicament, there is no guarantee that they will actually carry out their plan (Garnefski et al., 2001). Therefore, in order to be considered adaptive, the individual should act on their cognitions following the employment of this cognitive strategy. Positive reappraisal is employed when the individual uses the negative event as an

opportunity for personal growth (Garnefski et al., 2001). Furthermore, the putting into perspective strategy refers to when individuals deemphasize the seriousness of the negative event by comparing it to other instances (Garnefski et al., 2001). These strategies are positively associated with feelings of optimism and self-esteem and negatively related to symptoms of anxiety (Carver et al., 1989; Garnefski et al., 2001).

On the other hand, the refocusing on planning strategy is not as effective as the previously mentioned cognitive strategies. Refocusing on planning refers to when the individual thinks about the steps to take in order to deal with the negative emotions they are experiencing (Garnefski et al., 2001). According to Garnefski and colleagues (2001), this strategy is a helpful short-term response; however, is not adaptive in the long term. Therefore, the selection of another strategy over this one may be more effective.

Maladaptive cognitive emotion regulation strategies. Individuals who employ maladaptive cognitive strategies demonstrate a preoccupation with the negative event and thus fail to use adaptive forms of coping with negative emotions. There are four cognitive strategies that fall into this category: (a) self-blame, which refers to thoughts of holding oneself responsible for the negative event and being preoccupied with one's past mistakes leading to the event; (b) blaming others, which is employed when others are blamed for the event and feelings that one is experiencing; (c) rumination, which refers to being preoccupied with the feelings and thoughts associated with the negative event; and (d) catastrophizing, which refers to recurring thoughts of how the event they experienced is one of the worst things that can happen to a person (Garnefski et al., 2001). These four maladaptive cognitive strategies are associated with emotional distress and depression (Garnefski et al., 2001).

Behavioral emotion regulation strategies. Behavioral emotion regulation strategies use resources external to the self, such as the individuals, objects, places and activities or hobbies in their surroundings, to regulate one's emotions following the experience of a negative event (Phillips & Power, 2007). Similar to the cognitive emotion regulation strategies, behavioral strategies can also be divided up into adaptive and maladaptive strategies.

Individuals may use available social resources as a means of regulating negative affect (Bell & McBride, 2010; Garnefski et al., 2001; Macklem, 2008). For example, adolescents may ask people for their advice, seek physical contact, such as a hug or holding hands, from friends or family members. Adolescents can also use their social resources in a maladaptive way by transferring their negative emotions onto their friends, peers, and family members. Specifically, the adolescent who has just experienced a negative event may try alleviate their bad mood by making others feel bad, bullying their peers, or physically hurting others.

In an effort to relieve the negative emotions associated with the negative or stressful event, adolescents can engage in sports or hobbies that are enjoyable or go to places where they can relax and have a good time, such as the cinema or the mall (Phillips & Power, 2007). However, they can also transfer their negative emotions onto objects in their environment; for example, by deliberately causing damage to someone's property.

Although individuals frequently use behavioral strategies to regulate their emotions, researchers have not examined the extent to which adolescents employ these strategies over cognitive strategies in response to a negative event. Researchers have also

failed to examine the relationship between adolescents' use of these two types of

strategies following a negative event and their overall engagement in risky behaviors.

Risky Behaviors

Risky behaviors are behaviors that involve a trade-off of an immediate gain in

return for a long-term cost or consequence (Cooper et al., 2000; Leith & Baumeister,

1996). Adolescents engage in a number of risky behaviors including cheating, stealing,

drug and alcohol use, unsafe sex, physical and verbal harm to themselves and others as

well as other forms of delinquency. A study conducted by Galambos and Tilton-Weaver

(1998) found that approximately 65 % of Canadian adolescents between the ages 15 and

24 years of age have engaged in at least one type of risky behavior. In addition, the

Center for Disease Control and Prevention (Eaton et al., 2010) conducts a biannual

national survey, which measures the engagement of risky behaviors of students in grades

9 through 12 across the United States. Their findings indicate that 72.5% of youth have

had an alcoholic beverage, 46.3% have tried smoking, 38.9% did not use a condom the

last time they had intercourse, 17.5% have carried a weapon (knife or gun) at least once

in the 30 days prior to being surveyed and 31.5% have been in a physical fight 12 months

prior to being surveyed.

According to Arnett (1999), adolescents are more likely than children and adults

to engage in risky behaviors. Furthermore, Duncan, Duncan, and Strycker (2001)

conducted a study to determine if there are quantitative changes in problem behaviors

from late childhood to early adolescence. The authors used a cohort-sequential design,

which included 770 youth from four cohorts (11, 12, 13, 14 years old) that were assessed

annually for 5 years. Thus, the authors examined adolescents' frequency of engaging in

risky behaviors spanning the ages of 11 to 19. The results indicate that across adolescence, engagement in risky behaviors increases; however, engagement in such behaviors peaks in young adulthood (Arnett, 1999). Accordingly, instruction and interventions that target reducing adolescent risky behaviors should ideally be implemented into the school curriculum before students enter high school and are likely to have the opportunities to engage in such behaviors.

Outcomes related to engaging in risky behaviors. Although the prevalence of adolescents' engaging in risky behaviors has decreased from 1991 to the year 2010 (Eaton et al., 2010), high school students continue to engage in risky behaviors at levels higher than other age groups that are putting them at risk for morbidity and mortality (Eaton et al., 2010; Maggs, Frome, Eccles, & Barber, 1997).

In addition to putting their health at risk, these behaviors also effect the adjustment and overall well-being of adolescents (Maggs et al., 1997). According to Maggs and colleagues (1997), engaging in risky behaviors in adolescence is related to higher levels of emotional distress and family problems. Poor academic performance and failure is also associated with adolescents who engage in such behaviors (Cox, Zhang, Johnson, & Bender, 2007; Crosnoe, 2006). It is hypothesized that elevated levels of substance use contributes to declining academic performance among adolescents through reduced academic motivation or impaired cognitive ability that could interfere with the learning process (Cox et al. 2007). Crosnoe (2006) agrees that when adolescents consume high levels of alcohol, succeeding academically becomes harder to achieve and also less important to the student. Accordingly, it is important to find and target factors that make adolescents more or less likely to engage in such behaviors in order to

intervene appropriately and to reduce the likelihood that adolescents engage in such behaviors that put their well-being at-risk.

Emotion Regulation and Risky Behaviors

Researchers have found that the experience of negative emotions, such as anger, is predictive of delinquent behaviors (Pardini, Lochman, & Wells, 2004; Sigfusdottir, Farkas, & Silver, 2004). However, not all individuals that experience a negative event and subsequent intense emotions engage in risky behaviors. Rather, according to the literature, individuals that do not effectively regulate their emotions following a negative event are more likely to engage in such behaviors (Auerbach, Abela, & Ho, 2007; Auerbach et al., 2010; Cooper, Wood, Orcutt, and Albino, 2003; Curry & Youngblade, 2006; Hessler & Katz, 2010; Silk et al., 2003; Valois, Bryant, Rivard, Hinkle, 1997).

For example, researchers have identified increased engagement in risky behaviors in youth and adolescents with internalizing disorders, which are characterized with emotion regulation deficits. Internalizing disorders, such as depression, are characterized by deficits in maintaining positive emotions and ridding of negative emotions (Silk et al., 2003). Valois, Bryant, Rivard, and Hinkle (1997) investigated the relationship between sexual risk-taking behaviors among adolescents with severe emotional disturbances. They found that adolescents with severe emotional disturbance have higher rates of sexual intercourse compared to the students across the United States. These adolescents are also more likely than their typically developing peers to have their first intercourse before the age of 13.

Although individuals with externalizing disorders, such as conduct disorder, lack the ability to regulate negative emotions, particularly anger (Silk et al., 2003), there are

no studies to date that look at the relationship between emotion regulation and engagement in risky behaviors in this specific population.

Typically developing youth that have difficulties regulating their emotions have been found to engage in elevated levels of risky behaviors. Hessler and Katz (2010) conducted semi-structured interviews with 88 adolescents at two time points, at age nine and age 16. They found that adolescents that have difficulty regulating feelings of anger and sadness in late childhood and adolescence have a higher number of sexual partners and are more likely to use hard drugs (Hessler & Katz, 2010).

Similarly, Silk, Steinberg, and Morris (2003) surveyed 152 adolescents ages 12 to 17 in order to examine the link between adolescents' emotion regulation and adjustment. Unlike most studies that used questionnaires or interviews, the authors of this study used Experience Sampling Forms (ESF) with participants in order to assess adolescents' use of strategies following an emotionally salient experience. Specifically, every 90 to 150 minutes, participants' wristwatches would beep, instructing them to fill out an ESF. The questionnaire required participants to assess their emotional dynamics and the strategies they used within the previous hour. The adolescents also filled out the Youth Self-Report Form (Achenbach, 1991), which is a checklist of problem behaviors including lying, stealing and truancy that have been committed in the past six months. Their results reveal that adolescents that used maladaptive strategies such as denial, avoidance, wishful thinking, and rumination also reported higher levels of engagement in risky behaviors.

Cooper, Wood, Orcutt, and Albino (2003) examined the relationship between dysfunctional styles of regulating emotion and engagement in risky behaviors. The authors interviewed 1,978 Black and Caucasian adolescents from Buffalo, New York.

Their results suggest that adolescents who employ avoidant techniques to cope with negative emotions, such as denying the existence of the problem or diverting one's attention away from the situation, are more likely to engage in risky behaviors such as risky sexual behaviors, alcohol and drug use, and to engage in physical and criminal activity.

Furthermore, Auerbach, Claro, Abela, Zhu, and Yao (2010) examined the relationship between the use of cognitive emotion regulation strategies and Chinese adolescents' engagement in risky behaviors. The study consisted of 411 high school students living in China. Participants filled out several questionnaires including the Cognitive Emotion Regulation Questionnaire (CERQ) by Garnefski and colleagues (2001) and the Risky Behavior Questionnaire for Adolescents (RBQ-A) created by Auerbach and Abela, two questionnaires used in the present study. Their results reveal that adolescents that are more likely to use maladaptive cognitive emotion regulation strategies following the experience of a negative event engage in a greater number of risky behaviors. Auerbach, Abela, and Ho (2007) found similar results in a study conducted with undergraduate university students.

Curry and Younglade (2006) are the only researchers that have examined the relationship between adolescents' negative affect, their ability to suppress their aggression, a behavioral emotion regulation strategy, and their engagement in risky behaviors. Telephone surveys were conducted with 290 adolescents between 14 to 20 years old. Participants responded to items that probed if they had ever engaged in a certain type of risky behavior, including risky sexual practices, substance use, and criminal activity. If they have, then participants answered follow up questions about the

frequency that they engaged in the behavior over the last 12 months. Participants also

indicated how often they experienced feelings of anger, anxiety, and depression, over the

last two weeks. Finally, participants answered questions from the Impulse Control and

Suppression of Aggression subscales from Weinberger's Adjustment Inventory

(Weinberger & Schwartz, 1990), which assessed the adolescents' ability to suppress their

feelings of aggression when experiencing feelings of anger. The results of this study

revealed that feelings of anger predict risky behaviors, especially for adolescents with

difficulties suppressing their aggression. Although the authors look at suppression of

aggression, this is only one of the many behavioral strategies that can be used to regulate

affect following the experience of a negative event. Moreover, the subscale of the

Weinberger's Adjustment Inventory (Weinberger & Schwartz, 1990) used to measure

suppression of aggression also contained questions about impulse control, which is not an

emotion regulation strategy. Therefore, an analysis of the many types of behavioral

emotion regulation strategies being used by adolescents is needed.

　　　According to the studies reviewed in this section, the relationship between

cognitive emotion regulation strategies employed in response to negative affect and risky

behaviors is clear; however, that between behavioral emotion regulation strategies and

risky behaviors has not been established.

　　　Risky behavior as an emotion regulation strategy. Cooper and colleagues'

stress vulnerability model (1992; 1998; 2000; 2003) posits that individuals engage in

risky behaviors in order to avoid or escape aversive emotional states. Specifically, it is

often individuals who do not possess effective emotion regulation strategies that engage

in risky behaviors, as an alternative strategy, in order to attenuate negative affect. Unlike

in traditional risk models, it is not assumed that people engage in risky behaviors because they seek risk; rather, they simply recognize "... the capacity of a given risk behavior to alter mood states…" such as alleviating a negative mood (Cooper, Agocha, & Sheldon, 2000, p. 1061). This model is employed and discussed in several studies that seek to explain the role that emotion regulation plays in influencing adolescents' engagement in risky behaviors (Auerbach et al., 2010; Boyer, 2006; Curry & Youngblade, 2006; Hessler & Katz, 2010).

Klonsky and Muehlenkamp (2007) conducted a meta-analysis in order to determine the function of self-injury. The results reveal that a majority of the articles supported the affect regulation model of self-injury as the articles indicated that: (a) the negative emotion (anger, sadness, guilt, loneliness, and self-hatred) preceded the act of self-injury; (b) the act of self-injury is often performed with the intention to reduce the experience of negative affect, and (c) the performance of self-injury brings temporary emotional relief and a decrease in negative affect (Klonsky, 2007).

Subsequently, Klonsky (2009) conducted a study in order to better understand the affective functions of non-suicidal self-injury. Thirty-nine university undergraduates who have engaged in five or more cutting episodes participated in a structured interview that assessed four domains of their cutting behavior: (a) history of self-injury; (b) consequences that occur as a result of self-injury; (c) affect-states present before and after self-injury; and (d) reasons for self-injury. According to Klonsky (2009), 85% of the participants indicated the primary reason that they self-injure was to reduce negative affect. In addition, a majority of participants expressed feeling overwhelmed, sad, hurt emotionally, frustrated, and anxious before engaging in these behaviors. On the other

hand, the participants reported feeling calm and relieved following the self-injurious behavior. Similarly, a study by Mikolajczak, Petrides, and Hurry (2009) sampled 490 British adolescents and found that 80% of adolescents in their study reported harming themselves in an attempt to regulate unpleasant emotions.

Current Study

Past research has shown that there is a strong link between emotion regulation and adolescents' engagement in risky behaviors. Specifically, following the experience of a negative event, individuals who do not possess adaptive and effective emotion regulation strategies turn to high cost-high reward behaviors such as unsafe sexual practices, substance use, and self-injury to alleviate the experience of negative affect. Although the vast majority of emotion regulation research has concentrated on investigating the relationship between cognitive emotion regulation strategies and risky behaviors, there is a paucity of examining the role of behavioral strategies.

Accordingly, the primary goal of this study is to better understand the relationship between the cognitive and behavioral emotion regulation strategies adolescents' employ following a negative event and their engagement in risky behaviors.

In line with previous research which indicates that adolescents' use emotion regulation strategies is beginning to shift from the use of behavioral to cognitive strategies, the secondary goal of this study is to examine which of the two types of adolescents choose to use following the experience of a negative event. This study also seeks to extend the current literature on cognitive emotion regulation strategies and identify the specific adaptive strategies that are related to a reduction in adolescents' engagement in risky behaviors. The knowledge of which specific adaptive strategies are

the most effective at decreasing adolescents' engaging in risky behaviors will allow for the design and implementation of training programs designed to help adolescents effectively regulate their emotions in response to a negative event and subsequently reduce the likelihood that they will engage in risky behaviors.

Hypotheses of the current study. The first hypothesis is that adolescents will use more behavioral strategies than cognitive strategies in response to a negative event. Second, it is expected that adolescents will use more maladaptive cognitive strategies than behavioral ones in such circumstances. On the other hand, it is also expected that adolescents will make use of more adaptive behavioral than cognitive emotion regulation strategies following the experience of an unpleasant event. Although no previous studies have compared the frequency that adolescents use both types of strategies, these three hypotheses are consistent with the research of Bell and McBride (2010) and Garnefski et al. (2007) that cognitive structures involved in the regulation of emotions are still developing during adolescence; thus they will not use cognitive as frequently as they use behavioral strategies.

The third hypothesis predicts that the use of adaptive strategies, both behavioral and cognitive, following the experience of an unpleasant event will be related to adolescents engaging in less risky behaviors. Also, it is predicted that the use of maladaptive strategies, behavioral and cognitive, will be related to increases in engaging in risky behaviors. This hypothesis is consistent with the results of the articles previously reviewed (Auerbach et al., 2006; Auerbach et al., 2010; Cooper et al., 2003; Curry & Youngblade, 2006; Hessler & Katz, 2009; Klonsky, 2009; Mikolajczak et al., 2009; Silk et al., 2003).

The fourth hypothesis posits that adaptive behavioral strategies will be the most effective strategy to reduce the frequency that adolescents engage in risky behaviors. I also hypothesize that maladaptive cognitive strategies will be more predictive of adolescent risky behavior than the use of maladaptive behavioral strategies. This hypothesis was formulated based on literature that behavioral strategies are used at a much earlier age than cognitive strategies; thus, they will be used more frequently and effectively before adolescents even begin to use cognitive strategies. Furthermore, behavioral strategies are easier to employ as they make use of the people and objects in their immediate environment, whereas, cognitive strategies, require the brain to be adequately developed for their usage. They also require a significant amount of time and practice in order to be able to use them appropriately.

Method

Participants

A total of 78 adolescents were recruited from six inner-city high schools in Montreal, Canada. Of the 78 students, 48 (61.54%) were male and 30 (38.46%) were female. The adolescents ranged in age from 12 to 19 years of age ($M = 15.103$, $SD = 1.695$). Given the location of the schools participating in this study, their student bodies are comprised of various racial, ethnic, and socio-economic backgrounds. A majority of participants are primarily English speaking. In the sample 70.5% of participants reported English as their primary language, 11.5% reported French as their primary language, 7.7% reported both English and French as their primary languages, and 10.3% indicated a primary language other than English or French. Participants came primarily from low and middle class families as indexed by maternal education. Specifically, 15.4% of the

participants' mothers did not complete high school, 17.9% of mothers' completed high

school, 21.8% of mothers' completed some CEGEP or college, 6.4% completed some

university, and 24.4% of mothers' received a university degree. 14.1% of participants did

not know their mothers' highest level of education or chose not to respond.

Measures

   Demographics questionnaire. The adolescents completed a demographics

questionnaire consisting of questions about the participants' age, gender, parents' marital

status, parents' education, primary language used, and country of birth. The

demographics questionnaire also included questions about the adolescents' academic

average, if they have been held back a grade, if they currently hold any part-time

employment, and if they have ever been arrested.

   Revised Regulation of Emotions Questionnaire (REQ-2). The Revised

Regulation of Emotions Questionnaire (REQ-2; Phillips & Power, 2007) is an emotion

regulation self-report measure designed specifically for adolescents. This questionnaire

assesses the frequency that adolescents use external (behavioral) or rather their internal

(cognitive) resources to regulate their emotions. The measure includes 21 questions on a

5-point Likert scale ranging from never to always.   Moreover, there are four scales: (1)

internal-dysfunctional; (2) internal-functional; (3) external-dysfunctional; and (4)

external-functional. Examples of questions for each of the scales include: "I harm or

punish myself in some way", "I plan on what I can do better next time", "I take my

feelings out on people physically", and "I phone friends or family". The measure

demonstrates acceptable internal consistency with Cronbach's alpha ranging from $\alpha =$

0.66 to 0.76 (Phillips & Power, 2007). Moreover, results from the REQ-2 and other

measures of emotional and behavioral problems are related, which demonstrates the

validity of the measures.

        Cognitive Emotion Regulation Questionnaire (CERQ). The Cognitive Emotion

Regulation Questionnaire (CERQ; Garnefski, Kraaij, & Spinhoven, 2002) is a self-report

measure that assesses the use of cognitive coping strategies after having experienced a

stressful situation. The measure includes 36 items. Each item has responses ranging from

1 (almost never) to 5 (almost always). In addition, there are nine subscales, each

consisting of four items that demonstrate high internal consistency: Self-blame for the

event experienced, "I feel that I am responsible for what has happened" ($\alpha = 0.81$);

Acceptance of the stressful event, "I think that I have to accept the situation" ($\alpha = 0.80$);

Rumination of thoughts and feelings associated with the event, "I dwell on feelings the

situation has evoked in me" ($\alpha = 0.83$); Positive refocusing or thinking about positive

thoughts instead of the stressful event, "I think of nicer things than what I have

experienced" ($\alpha = 0.81$); Refocusing on planning of the steps required to deal with the

event "I think about how I can best cope with the situation" ($\alpha = 0.81$); Positive

reappraisal or thinking about the positive meaning of the event "I think I can learn

something from the situation" ($\alpha = 0.72$); Putting into prospective and reducing the

seriousness of the event "I think that it all could have been much worse" ($\alpha = 0.79$);

Catastrophizing and emphasizing the negative "I continually think how horrible the

situation has been" ($\alpha = 0.71$); and Other-blame for the stressful event "I think that

others are responsible for what has happened" ($\alpha = 0.68$). Moreover, it has been found

that adolescents' scores between each of the scales of the measure are highly correlated

with one another (Garnefski et al., 2002).

Risky Behaviors Questionnaire for Adolescents (RBQ-A). The Risky

Behaviors Questionnaire for Adolescents (RQB-A; Auerbach, & Abela, 2008) is a 20-

item self-report questionnaire, which measures the adolescents' frequency of engagement

in risky behaviors over the past month. The measure employs a 5-point scale that

includes: never, almost never (once per month), sometimes (2-4 times per month), almost

always (2-3 times per week), and always (4 or more times a week). There are 6 subscales

that measure: unsafe sexual practices, aggressive and/or violent behaviors, rule breaking,

dangerous, destructive, and/or illegal behaviors, self-injurious behaviors, and alcohol

and/or drug use. The measure displays high internal consistency with a Cronbach's alpha

ranging from an α of 0.81 to 0.85 (Auerbach et al., 2010). Furthermore, the measure

displays high discriminant validity as it is related to measures of impulsiveness and

maladaptive coping strategies (Auerbach et al., 2010).

Procedure

Students' classrooms were visited by a team of research assistants who described

the purpose of the study and distributed consent forms to the students interested in

participating. The research assistants instructed students to have their parents sign the

forms and to bring them back to school.

The research assistants returned approximately one-week later to distribute the

surveys. Students who obtain parental consent to participate in the study were brought

into the school library to complete the surveys. Prior to distributing the surveys to

students, the research assistants presented information to the students regarding the

purpose of the study and what is expected of them. The participants were informed that

the completion of the questionnaire package would require approximately 15 to 20

minutes to complete. The students were also told that their responses would be

confidential, except in cases where responses indicate that they are a harm to themselves

or others, that they could leave any questions blank, and that they could decline to

participate or stop participating at any time without penalty, and that their participation in

the study would not affect their grades. The students were informed that their names

would be included in a draw to win an iPod and one of 10 pairs of movie tickets.

Research assistants then handed out a package to each of the students. Each

package contained an assent form, a demographics form, and three questionnaires

including the Revised Regulation of Emotions Questionnaire (REQ-2; Phillips & Power,

2007), Cognitive Emotion Regulation Questionnaire (CERQ; Garneski et al., 2002), and

the Risky Behavior Questionnaire for Adolescents (RBQ-A; Auerbach & Abela, 2008).

Finally, the participants were debriefed regarding their participation in the study.

When a student indicated on the Risky Behavior Questionnaire for Adolescents

(RBQ-A; Auerbach & Abela, 2008) that he or she was either a risk to himself or herself

or others, the student was notified that confidentiality would need to be broken. The

school psychologist or counselor was immediately notified and the subsequent steps were

discussed with the primary investigator.

Statistical Analysis Overview

Descriptive statistics of the study variables including risky behaviors, and the four

strategies as measured by the REQ-2 were analyzed. Subsequently, in order to compare

the means of the four strategies three paired samples t-test were conducted. The first

paired samples t-test compared the means of adolescents' overall use of behavioral and

cognitive strategies, regardless of whether the strategies employed are considered to be

adaptive or maladaptive. The second t-test compared adolescents' use of functional behavioral and cognitive strategies. Finally, the third t-test compared the use of dysfunctional behavioral and cognitive strategies.

Next, a series of correlations were calculated in order to determine the relationship between each of the emotion regulation subscales, described above, and adolescents' overall scores on the RBQ. The age and gender of the adolescents were also included in the analyses.

Finally, a hierarchical multiple regression analysis was preformed between risky behaviors as the dependent variable and the four groups of strategies as the predictor variables. Adolescents' age and gender were controlled in the analysis, as this study's main focus is the relationship between emotion regulation strategies and risky behaviors. Accordingly, the independent variables that were controlled for (i.e., age and gender) were entered in the first stage of the regression. Next, all four groups of strategies (i.e., adaptive/maladaptive cognitive and behavioral) were entered into the model using the stepwise method. The empirical stepwise method was chosen because there is no theory that examines or compares both cognitive and behavioral emotion regulation strategies and would guide order of entry into the equation. All of the above-mentioned statistics used a value of $p < 0.05$ to indicate statistical significance.

Results

Descriptive Statistics

Table 1 presents the descriptive statistics of participants' engagement in risky behaviors and their use of emotion regulation strategies.

Table 1

Descriptive Statistics of Main Study Variables

Variable	N	Mean	SD	Range
Risky Behaviors (max = 100)	78	13.46	11.306	0-56
Adaptive Cognitive Strategies (max = 25)	78	10.96	2.947	5-20
Maladaptive Cognitive Strategies (max = 25)	78	8.71	3.513	4-20
Adaptive Behavioral Strategies (max = 30)	78	16.38	4.292	7-26
Maladaptive Behavioral Strategies (max = 25)	78	8.65	3.053	5-21

Adolescent Strategy Use

Overall strategy use. A paired samples t-test was conducted in order to determine whether adolescents use one type of strategy (i.e., behavioral or cognitive) significantly more than the other following the experience of negative emotions. The test revealed that adolescents use significantly more behavioral strategies ($M = 23.039$, $SD = 4.7$) than cognitive strategies ($M = 19.667$, $SD = 5.078$), $t(77) = 8.148$, $p < 0.05$.

Cognitive strategies. Adolescents' use of cognitive strategies in response to negative emotions was measured by the REQ-2. Use of adaptive cognitive strategies ranged from 5 to 20 ($M = 10.96$, $SD = 2.947$). Use of maladaptive cognitive strategies ranged from 4 to 20 ($M = 8.71$, $SD = 3.513$). Adolescents' use of adaptive cognitive strategies is significantly higher than their use of maladaptive cognitive strategies, $t(77) = 4.940$, $p < 0.05$.

Behavioral strategies. Adolescents' employment of behavioral strategies in response to negative emotions was also measured by the REQ-2. Use of adaptive

behavioral strategies ranged from 7 to 26 ($M = 16.38$, $SD = 4.292$). Use of maladaptive

behavioral strategies ranged from 5 to 21 ($M = 8.65$, $SD = 3.053$).   Adolescents' use of

adaptive behavioral strategies is significantly higher than their use of maladaptive

behavioral strategies, $t(77) = 11.815$, $p < 0.05$.

Adaptive strategy use. A paired samples t-test was used to examine whether

adolescents use adaptive cognitive strategies or behavioral strategies significantly more

than the other. Results indicate that adolescents use significantly more adaptive

behavioral strategies ($M = 16.36$, $SD = 4.292$) than adaptive cognitive strategies ($M =$

10.96, $SD = 2.947$), $t(77) = 11.220$, $p < 0.05$.

Maladaptive strategy use. An additional paired samples t-test was conducted to

determine whether adolescents use maladaptive cognitive strategies or behavioral

strategies significantly more than the other. According to the results, the frequency that

adolescents use maladaptive behavioral strategies ($M = 8.65$, $SD = 3.053$) and

maladaptive cognitive strategies ($M = 8.71$, $SD = 3.513$) do not significantly differ, $t(77)$

$= -0.122$, $p > 0.05$.

Adolescent Engagement in Risky Behaviors and Strategy Use

Table 2 presents a correlation matrix among all the variables included in the

study.

First, a significant correlation was found between risky behaviors ($M = 13.46$, SD

$= 11.306$) and adaptive cognitive strategies ($M = 10.96$, $SD = 2.947$), $r(76) = -0.244$, $p <$

0.05, with R^2 at 0.060. Therefore, the increased use of adaptive cognitive strategies is

related to a reduction in the likelihood of adolescents' risky behaviors. Similarly, a

significant correlation was also found between risky behaviors ($M = 13.46$, $SD = 11.306$)

and maladaptive cognitive strategies ($M = 8.71$, $SD = 3.513$), $r(76) = 0.338$, $p < 0.05$,

with R^2 at 0.114. This indicates that an increase in the use of maladaptive cognitive

strategies is related to an increase in risky behaviors.

In addition, a significant correlation was found between risky behaviors ($M =$

13.46, $SD = 11.306$) and maladaptive behavioral strategies ($M = 8.65$, $SD = 3.053$), $r(76)$

$= 0.461$, $p < 0.05$, with R^2 at 0.213. This indicates that increased use of maladaptive

behavior strategies used following the experience negative emotions is related to

increased engagement in risky behaviors. On the other hand, no relationship between

adaptive behavioral strategies ($M = 16.38$, $SD = 4.292$) and risky behaviors ($M = 13.46$,

$SD = 11.306$) was found, $r(76) = -0.148$, $p > 0.05$, with R^2 at 0.022.

Specific cognitive strategies and risky behaviors. Previous studies have only

established a relationship between cognitive strategies and adolescents' risky behaviors

(i.e., Auerbach et al., 2010). This study extends the literature by examining which

specific cognitive strategies, as measured by the CERQ, are related to adolescents' risky

behaviors.

In terms of the relationship between specific adaptive cognitive strategies and

risky behaviors, the following results were found. Significant correlations were found

between positive refocusing ($M = 10.92$, $SD = 3.897$) and risky behaviors ($M = 13.46$, SD

$= 11.306$), $r(76) = -0.321$, $p < 0.05$, with R^2 at 0.10.3, refocusing on planning ($M = 11.87$,

$SD = 3.801$) and risky behaviors ($M = 13.46$, $SD = 11.306$), $r(76) = -0.292$, $p < 0.05$, with

R^2 at 0.085, positive reappraisal ($M = 12.01$, $SD = 4.063$) and risky behaviors ($M = 13.46$,

$SD = 11.306$), $r(76) = -0.362$, $p < 0.05$, with R^2 at 0.131, and finally putting into

perspective ($M = 12.12$, $SD = 3.672$) and risky behaviors ($M = 13.46$, $SD = 11.306$), $r(76)$

= -0.320, $p < 0.05$, with R^2 at 0.102. More specifically, increased use of each of these adaptive cognitive strategies is significantly related to a lower incidence of adolescents' engagement in risky behaviors.

However, no specific maladaptive cognitive strategies from the CERQ were significantly related to adolescents' engagement in risky behaviors.

Table 2

Correlations Among Study Variables

Variable	1	2	3	4	5	6	7
1. Age	-						
2. Gender	.265*	-					
3. Cognitive Adaptive Strategies	.287*	.028	-				
4. Cognitive Maladaptive Strategies	-.025	.021	.230*	-			
5. Behavioral Adaptive Strategies	.023	.009	.351*	-.031	-		
6. Behavioral Maladaptive Strategies	-.146	-.223	-.105	.369**	-.216	-	
7. Risky Behaviors	-.161	-.307*	-.244*	.338*	-.148	.320*	-

Note: * $p < 0.05$

Prediction of Adolescents' Engagement in Risky Behaviors by Use of Emotion

Regulation Strategies

A hierarchical multiple regression analysis was performed in order to establish a

model that is able to predict adolescents' engagement in risky behaviors based on the

emotion regulation strategies employed following the experience of a negative event.

Table 3 displays the parameter estimate (b), the standard error, and the t-value for the two

covariates and the three predictor variables. R for regression was significantly different

from zero, $F(5, 72) = 8.504$ $p < 0.05$, with R^2 at 0.371, suggesting a significant

relationship between the five regression coefficients and the dependent variable. The

adjusted R^2 of 0.328 indicates that a third of the variability in risky behaviors is predicted

by gender, age, maladaptive behavioral strategies, maladaptive cognitive strategies, and

adaptive cognitive strategies.

Next, all four groups of strategies were entered into the model using a stepwise

method. In the second model produced, maladaptive behavioral strategies were included

into the model. R for regression was significantly different from zero, $F(3, 74) = 8.590$, p

< 0.05 with R^2 at 0.258, suggesting a statistically significant relationship between age,

gender, maladaptive behavioral strategies, and the dependent variable risky behaviors.

The R-Square Change statistic for the increase in R^2 associated with the addition of

maladaptive behavioral strategies is 0.157 indicating that the addition of maladaptive

behavioral strategies to the model increased the predictability of the variability in risky

behaviors by 15.7%. Moreover, the adjusted R^2 value of 0.228 indicates that age, gender,

and maladaptive behavioral strategies predict 22.8% of the variability in risky behaviors.

Table 3

Summary of the Regression Models

Model	F-Value	R^2	Adjusted R^2	R^2 Change
1. Age & Gender	4.216*	0.101	0.077	-
2. Age, Gender, & Maladaptive Behavioral Strategies	8.590*	0.258	0.228	0.157
3. Age, Gender, Maladaptive Behavioral Strategies, & Maladaptive Cognitive Strategies	7.855*	0.301	0.263	0.043
4. Age, Gender, Maladaptive Behavioral Strategies, Maladaptive Cognitive Strategies, & Adaptive Cognitive Strategies	8.504*	0.371	0.328	0.070

Note: * $p < 0.05$

In the third model produced, maladaptive cognitive strategies were added to the

model. R for regression was significantly different from zero, $F(4, 73) = 7.855$, $p < 0.05$

with R^2 at 0.301 suggesting a statistically significant relationship between age, gender,

maladaptive behavioral strategies, maladaptive cognitive strategies, and the dependent

variable risky behaviors. The R-Square Change statistic for the increase in R^2 associated

with the addition of maladaptive cognitive strategies is 0.043, indicating that the addition

of maladaptive cognitive strategies to the model increased the predictability of the

variability in risky behaviors by 4.3%. Moreover, the adjusted R^2 value of 0.263

indicates that age, gender, maladaptive behavioral strategies, and maladaptive cognitive

strategies predict 26.3% of the variability in risky behaviors.

In the final model produced, adaptive cognitive strategies were added to the

model. Once again, R for regression was significantly different from zero, $F(5, 72) =$

8.504, $p < 0.05$ with R^2 at 0.371, suggesting a statistically significant relationship

between age, gender, maladaptive behavioral strategies, maladaptive cognitive strategies,

adaptive cognitive strategies and the dependent variable risky behaviors. The R-Square

Change statistic for the increase in R^2 associated with the addition of adaptive cognitive

strategies is 0.070 indicating that the addition of adaptive cognitive strategies to the

model increased the predictability of the variability in risky behaviors by 7%. Moreover,

the adjusted R^2 value of 0.328 indicates that age, gender, maladaptive behavioral

strategies, maladaptive cognitive strategies, and adaptive cognitive strategies predict

32.8% of the variability in risky behaviors.

The final regression model produced by the analysis did not result in a significant

relationship between adaptive behavioral strategies and risky behaviors, $t(77) = 0.254$, p

> 0.05; therefore, it was not included in the predictive model.

Overall, the scores of the five regression coefficients predict 37.1% (32.8% adjusted) of the variability in risky behaviors. Most importantly, adding the three groups of emotion regulation to the model increased the model's ability to account for 27% of the variability in risky behaviors. Moreover, the direction of the relationship suggests that higher frequencies of risky behaviors are associated with being male, high use of maladaptive behavioral and cognitive strategies, as well as less use of adaptive cognitive strategies.

Gender is the best predictor of risky behaviors, with a b of -5.933, $t(77) = -2.572$, $p < 0.05$. Adaptive cognitive strategies are the second best predictor of risky behaviors, with a b of -1.120 $t(77) = -2.839$, $p < 0.05$. The third best predictor of risky behaviors is maladaptive cognitive strategies, with a b of 1.014, $t(77) = 2.966$, $p < 0.05$. Maladaptive behavioral strategies are the fourth best predictor of risky behaviors, with a b of 0.969, $t(77) = 2.464$, $p < 0.05$. Finally, the fifth best predictor of risky behaviors is age, with a b of 0.246, $t(77) = 0.363$, $p > 0.05$.

Table 4

Predictors of Risky Behaviors

Predictor	Parameter Estimate (b)	Standard Error	t-Value
Gender	-5.933	2.307	-2.572*
Age	0.246	.679	0.363
Behavioral Maladaptive Strategies	0.969	.393	2.464*
Cognitive Maladaptive Strategies	1.014	.342	2.966
Cognitive Adaptive Strategies	-1.120	.394	-2.839 *

Note: * $p < 0.05$

Discussion

The present study examined the association between adolescents' use of cognitive and behavioral emotion strategies following the experience of a negative event and their engagement in risky behaviors. Results revealed that adolescents are more likely to use behavioral strategies to regulate their emotions in response to an unpleasant event than they are to use cognitive strategies. More specifically, the findings suggest that adolescents are significantly more likely to use adaptive behavioral strategies, than to use cognitive strategies following the experience of a negative event. The results also revealed that adolescents' use of adaptive cognitive emotion regulation strategies increases with age. Given that adolescence is the period of development where the cognitive structures necessary to be able to regulate one's emotions internally are still maturing (Macklem, 2008; Steinberg, 2005; Zeman et al., 2006), it is possible that adolescents are still relying more on the behavioral strategies that they have used from a young age. Thus, adolescents are beginning to use and master cognitive emotion regulation strategies; however, the use of cognitive strategies may not be as automatic to the adolescent as using the behavioral strategies with which they are familiar. Moreover, given that adolescents spend a majority of their time with their peers, going to the mall or movies, or playing sports, it is possible that they are more likely to use these activities as a method of coping with negative emotions rather than reappraising the situation in a positive manner, for example.

However, contrary to our hypothesis, adolescents' use of maladaptive behavioral emotion regulation strategies did not differ from their use of maladaptive cognitive strategies. It was hypothesized that if adolescents tried to use cognitive strategies to

regulate their negative emotions, they would use the cognitive strategies in a maladaptive manner; therefore, they opt to use the behavioral strategies that they have been exposed to and have been using for much longer. On the other hand, these findings could be explained by considering that adolescence is a period of "storm and stress" (Arnett, 1999; Hall, 1904), making it likely that adolescents will act out if they are upset or angry. Therefore, during this period of development, it is equally likely for adolescents to respond in a maladaptive behavioral manner, such as by physically or verbally taking their feelings out on others, or for them to use maladaptive cognitive strategies such as ruminating, or blaming themselves, or others for the occurrence of a negative event.

The current study is the first to examine the relationship between adolescents' use of cognitive and behavioral emotion regulation strategies in response to an unpleasant event and their engagement in risky behaviors. In line with our hypothesis, both maladaptive behavioral and cognitive strategies are significantly related to adolescents' engagement in risky behaviors. These results are consistent with previous findings (Auerbach et al., 2007; Auerbach et al., 2010; Cooper et al., 2003; Silk et al., 2003), that maladaptive cognitive strategies used following the experience of a negative event are positively related to adolescents' engagement in risky behaviors. These findings also support Cooper and colleague's stress vulnerability model (1992; 1998; 2000; 2003) and the related literature (Klonsky, 2007; 2009; Mikolajczak et al., 2009) by revealing that adolescents that do not possess the adequate strategies to modulate negative emotions effectively following an unpleasant event are more likely to use risky behaviors than those who use adaptive strategies. Therefore, it is plausible that adolescents with a repertoire of maladaptive and ineffective emotion regulation strategies use risky

behaviors as an alternative strategy to help them feel better.

Also consistent with the literature, adaptive cognitive strategies are negatively related to adolescents' risky behaviors. Therefore, adolescents that have a repertoire of effective cognitive strategies are better able to cope with the experience of negative events and emotions, and do not need to rely on maladaptive behaviors to feel better about their circumstances. However, adolescents' use of adaptive behavioral strategies following a negative event is not significantly related to a lower incidence of engagement in risky behaviors. It is possible that the behavioral strategies, including playing sports, going to a movie, or talking to a parent or friend, may distract the adolescent from their negative feelings; however, they are not adequate strategies to completely relieve the negative emotions that are brought on by an unpleasant event. Therefore, if adolescents are not able to effectively use cognitive strategies, it is possible that they will resort to engaging in risky behaviors as a means of relieving their negative feelings.

This study is also the first that examines which strategies are the best predictors of adolescents' risky behaviors. The results suggest that adaptive cognitive strategies are the best predictor of adolescents' risky behaviors, followed by maladaptive cognitive strategies and maladaptive behavioral strategies. These results are inconsistent with our hypothesis in that maladaptive strategies, both cognitive and behavioral, are better predictors of risky behaviors than adaptive behaviors. Furthermore, my hypothesis that adaptive behavioral strategies are better predictors of reduced risky behaviors than adaptive cognitive strategies was also not supported. These results have important theoretical and practical implications, as the findings indicate that adolescents' use of adaptive cognitive emotion regulation strategies is the best predictor of risky behaviors.

These findings provide evidence to suggest that the education of adaptive cognitive emotion regulation strategies should be implemented into students' social-emotional curriculum, in order to increase the well-being of our students and could also curb the likelihood of them engaging in risky behaviors.

Our findings also suggest that gender is a strong predictor of adolescents' engagement in risky behaviors. Specifically, the results reveal that males were significantly more likely than females to engage in risky behaviors. This is consistent with findings from a study by Auerbach, Claro, Abela, Zhu, and Yao (2010) that also used the RBQ-A questionnaire to measure adolescents' risky behaviors. On the other hand, we did not find that age was a significant predictor of adolescent risky behaviors, which is inconsistent with the findings from the study conducted by Duncan, Duncan, and Strycker (2001), which found that adolescents were more likely to engage in risky behaviors as they progressed through adolescence. The age of participants in our sample ranged from 12 to 19 years old. Although there were few adolescents that were 12, 18, and 19 years old, a majority of the participants were between 13 and 17 years of age; therefore, our sample does have approximately an equal number of adolescents of each age. It is possible that we had too few participants of each age to effectively determine if there is a relationship between age and risky behaviors. Specifically, there was average of 9.75 participants per age, with a maximum of 18 and a minimum of 1.

As no other study has examined the relationship between adolescents' use of behavioral and cognitive emotion regulation strategies following an unpleasant event and their engagement in risky behaviors, the current study addresses a critical theoretical gap in understanding the functions of emotion regulations. In addition, applying these

findings in clinical settings could significantly impact the overall well-being of adolescents.

Clinical Implications

Many adolescents engage in risky behaviors (Eaton et al., 2010; Maggs et al., 1997) that put them at risk for academic and interpersonal problems, morbidity and mortality. According to this study's findings, the use of maladaptive cognitive and behavioral strategies following an unpleasant event increases the likelihood that adolescents engage in risky behaviors; whereas, adaptive cognitive strategies is related to a reduction in these behaviors. Therefore, working with adolescents to improve and make use of their adaptive cognitive emotion regulation strategies, could significantly reduce the likelihood that adolescents will engage in risky behaviors. To date, there are no interventions that target emotion regulation in an effort to reduce risky behaviors, nor are there interventions that look to improve the use of cognitive emotion regulation strategies. However, given that adolescents do use their behaviors to reduce the experience of negative affect, the instruction of adaptive cognitive emotion regulation should be included in the psycho-social programs before students enter high school and the opportunities for them to engage in such serious behaviors significantly increases. Working on improving children and adolescents' use of these strategies following the experience of an unpleasant event could also improve the physical and emotional well-being of adolescents as well as their academic performance.

Limitations and Future Directions

Several limitations of the current study should be noted and considered for future studies conducted on this topic. First, the current study only used self-report measures of

adolescents' use of emotion regulation strategies and their engagement in risky behaviors. Future studies could benefit from the use of semi-structured interviews in order to assess in better detail and with better accuracy how adolescents respond to the experience of negative feelings or events. Using this method, it would be possible to quantify the frequency that participants engage in risky behaviors and whether these behaviors occur in response to negative emotions. Furthermore, it is likely that the measures used in this study did not include all of the possible strategies, either cognitive or behavioral, that adolescents use to relieve the feelings of negative affect. Therefore, interviews will result in a compilation of all of the possible strategies that adolescents use in such circumstances.

Second, the current study only assesses participants' engagement in risky behaviors for the period of the previous month. Ideally, participants' engagement in risky behaviors should be assessed at multiple time points. For example, Auerbach and colleagues (2010) administered the RBQ-A once a month for a period of six months. There are two advantages of this approach. This would allow for a better idea of how often adolescents included in our sample engage in such behaviors, as this may fluctuate over time. This approach would also verify if adolescents are being honest when answering the questionnaire, as large discrepancies in responses could be questioned.

Third, our sample only included students from inner-city Montreal high schools. Therefore, it is possible that some rates of risky behaviors and use of maladaptive strategies may be inflated. Future studies should also include students from high schools that have a more equal distribution of socio-economic status.

This type of research question would also benefit from the use of Experience

Sampling Forms (ESF) similar to those used in the study conducted by Silk, Steinberg, and Morris (2003). More specifically, researchers could instruct adolescents to complete the ESFs shortly following the experience of a negative event that resulted in any negative emotions, such as sadness and anger. Adolescents could be asked questions about the negative event, the individuals involved in the event, as well as the strategies used in order to relieve the negative affect.

Finally, findings from this study and subsequent studies should be used to develop an intervention for elementary and high school students in order to improve their use of adaptive cognitive strategies and reduce the likelihood that they will engage in risky behaviors. Pre- and post-intervention data on the emotion regulation strategies being used and the frequency that participants engage in risky behaviors will results in a better understanding of the relationship between these two constructs.

Conclusion

The current study is the first to investigate the relationship between adolescents' use of behavioral and cognitive emotion regulation strategies following the experience of an unpleasant event and their engagement in risky behaviors. Overall, it was concluded that adolescents use a higher frequency of behavioral emotion regulation strategies than cognitive strategies following the experience of negative affect. The findings of this study also indicate that the use of maladaptive cognitive and behavioral strategies following an unpleasant event is associated with an increase in risky behaviors; however, the use of adaptive behavioral strategies is not associated with adolescents' engagement in risky behaviors. Most importantly, the use of cognitive adaptive emotion regulation strategies in response to a negative event has the potential to reduce the likelihood that

adolescents engage in risky behaviors. Although adolescents engage in more behavioral strategies, these results suggest that adolescents use cognitive strategies more effectively than it was previously believed. Future research directions include a more thorough investigation of adolescents' use of emotion regulation strategies and their engagement in risky behaviors through the use of interviews or Experience Sampling Forms (ESF), as well as conducting and determining the effectiveness of interventions that target adolescents' risky behaviors through the training of adaptive cognitive emotion regulation strategies. Furthermore, this study has clinical implications that could reduce the likelihood that adolescents engage in risky behaviors and improve their physical and psychological well-being.

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Appendix A

RESEARCH CONSENT FORM

Institution: Faculty of Education, McGill University

Title of Project: Understanding the Influence of Emotion Regulation on
                            Adolescents' Engagement in Risky Behaviors

Researchers: Melissa Stern, M.A. Student, School/Applied Child Psychology
                            & Anthony Claro, M.A., PhD Student, School/Applied Child
                            Psychology

Project Supervisor: Steven Shaw, Ph.D.

Dear Parent or legal guardian,

What is the purpose of the study?
The purpose of this study is to understand how adolescents' ability to control their emotions
following a negative event is related to their participation in problem behaviors, which range from
mild behaviors, such as lying to a friend or family member, skipping class, to more serious
behaviors, such as bullying a peer, as well as aggressive behaviors.
Your child's participation is this study is entirely voluntary and your child is allowed to refuse to
participate in this task, decline to answer any question, or withdraw at any point from the project
without penalty. In addition, your child's participation will have no effect on their academic
performance at school.
The findings stemming from this study will be disseminated to a range of professionals including
educators and psychologists through a Master's and a doctoral thesis, presentation at both
national and international conferences, and article(s) in peer-reviewed, scientific journals.

What will my child be required to do?
Upon your written consent, your child will be asked to complete four questionnaires that pertain
to their ability to regulate their emotions as well as their engagement in problem behaviors. The
questionnaires will take approximately 25 minutes to complete and your child's participation will
take place in their classroom during class time.
In order to compensate your child for their participation, their name will be entered into a draw to
win one of several prizes including one iPod and ten movie passes.

Privacy and Confidentiality
To ensure confidentiality, your child will be assigned a file number, and all materials collected
from your child will be labeled with only the case number. A list of the participant's names with
their assigned file numbers will be kept separately from the collected materials and stored in a
locked cabinet at our research unit on the McGill University campus. Only the principal
investigator (Melissa Stern), co-investigator (Anthony Claro), the research supervisor (Dr. Steven
Shaw), and designated undergraduate research assistants will have access to this information. If
and when the data is included in future academic presentations and publications, no mention of
your child's identity will be made and only group results will be reported.
However, should your child's responses indicate that they are either a danger to themselves or
others, the school-based mental health professionals will be notified and consulted about the
situation. Parents will also be informed.

Benefits, Potential Harms and Risk
Your son/daughter's participation will help us to better understand how adolescents' emotions influence engagement in problem behaviors. In addition, these findings will later inform interventions.
There is minimal risk associated with completing these questionnaires and your child does not have to complete any questionnaires or questions at any point that he/she does not feel comfortable answering. However, due to the nature of the questions asked, it is possible, that they may ellicit an emotional reaction from the individuals participating in the study. In the case that the questions do trigger an emotion reaction, your child will be provided with information on psychological services available to them in the school and community should they be necessary.

Declaration of the parent or legal guardian:
I have read the above description and have been fully informed about the procedures, demands, risks and benefits of the study. I freely and voluntarily consent for my child to participate in this study.

_____

Name of participant   Signature of parent/legal guardian   Date

_____

Date of birth of participant

_____

Name of investigator   Signature of investigator   Date

If you have any other questions or concerns please feel free to contact one of the research team members by using the information indicated below. Should you have any questions or concerns about your child's rights as a volunteer in this project you may contact the McGill Research Ethics Officer at 514-398-6831.

We thank you kindly for considering this request and hope that we can have your child's participation in this study.

Sincerely,

Melissa Stern
Master's Student, School/Applied Child Psychology
Faculty of Education, McGill University
3700 Rue McTavish, Room 614
Montreal, Quebec, H3A1Y2

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Appendix B

RESEARCH ASSENT FORM

Institution: Faculty of Education, McGill University

Title of Project: Understanding the Influence of Emotion Regulation on
                            Adolescents' Engagement in Risky Behaviors

Researchers: Melissa Stern, M.A. Student, School/Applied Child Psychology
                            & Anthony Claro, M.A., PhD Student, School/Applied Child
                            Psychology

Project Supervisor: Steven Shaw, Ph.D.

What is the purpose of the study?
The purpose of this study is to understand how adolescents' ability to control their emotions
following a negative event is related to their participation in problem behaviors, which range from
mild behaviors, such as lying to a friend or family member, skipping class, to more serious
behaviors, such as bullying a peer, as well as aggressive behaviors.
The findings stemming from this study will be disseminated to a range of professionals including
educators and psychologists through a Master's and a doctoral thesis, presentation at both
national and international conferences, and article(s) in peer-reviewed, scientific journals.

What will I be required to do?
With my written permission, I will be asked to complete four questionnaires that pertain to my
ability to regulate my emotions as well as my participation in a variety of behaviors. The
questionnaires will take approximately 25 minutes to complete and my participation will take
place in my classroom during class time.
My participation is this study is entirely voluntary and I am allowed to refuse to participate in this
task, decline to answer any question, or withdraw at any point in time without penalty. Whether
or not I choose to participate in this research study will have no effect on my academic
performance.
In addition, in order to compensate me for my participation, my name will be entered into a draw
to win one of several prizes including one iPod and ten movie passes.

Privacy and Confidentiality
To ensure confidentiality, I will be assigned a file number, and all materials collected from me
will be labeled with only the case number and not any of my personal information, such as my
name or birth date. A list of the participant's names with their assigned file numbers will be kept
separately from the collected materials and stored in a locked cabinet at our research unit on the
McGill University campus. Only the principal investigator (Melissa Stern), co-investigator
(Anthony Claro), the research supervisor (Dr. Steven Shaw), and designated undergraduate
research assistants will have access to this information. If and when the data is included in future
academic presentations and publications, no mention of my identity will be made and only group
results will be reported.
However, should my responses indicate that I am a danger to myself or others, the school-based
mental health professionals will be notified and consulted about the situation. My parents will
also be informed.

Benefits, Potential Harms and Risk
Your participation will help us to better understand how adolescents' emotions influence engagement in problem behaviors.
There is minimal risk associated with completing these questionnaires and you do not have to complete any questionnaires or questions at any point that you do not feel comfortable answering. However, due to the nature of the questions asked, it is possible, that they may elicit an emotional reaction from the individuals participating in the study. In the case that the questions do trigger an emotion reaction, you will be provided with information on psychological services available to you in the school and community should they be necessary.

Declaration of assent from the participant:
I have read the above description with one of the investigators. I have been fully informed about the procedures, demands, risks and benefits of the study. I understand that I may withdraw from this study at any time without any penalty. I freely and voluntarily assent to participate in this study.

_____

Name of participant   Signature of participant   Date

_____

Date of birth of participant

_____

Name of investigator   Signature of investigator   Date

If you have any other questions or concerns please feel free to contact one of the research team members by using the information indicated below. Should you have any questions or concerns about your rights as a volunteer in this project you may contact the McGill Research Ethics Officer at 514-398-6831.

We thank you kindly for considering this request and hope that we can have your participation in this study.

Sincerely,

Melissa Stern
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Appendix C

Regulation of Emotion Questionnaire 2

We all experience lots of different feelings or emotions. For example, different things in our lives make us feel happy, sad, angry and so on…

The following questions ask you to think about **how often** you do certain things **in response to a negative or unpleasant event**. You do not have to think about specific emotions but just how often you **generally** do the things listed below.

Please tick the box corresponding to the answer that fits best. We all respond to our emotions in different ways so there are no right or wrong answers.

In GENERAL how do you respond to your emotions?	Never	Seldom	Often	Very Often	Always
1. I talk to someone about how I feel	○	○	○	○	○
2. I take my feelings out on others verbally (e.g. shouting, arguing)	○	○	○	○	○
3. I seek physical contact from friends or family (e.g. a hug, hold hands)	○	○	○	○	○
4. I review (rethink) my thoughts or beliefs	○	○	○	○	○
5. I harm or punish myself in some way	○	○	○	○	○
6. I do something energetic (e.g. play sport, go for a walk)	○	○	○	○	○
7. I dwell on my thoughts and feelings (e.g. It goes round and round in my head and I can't stop it)	○	○	○	○	○

In **GENERAL** how do you respond to your emotions?	Never	Seldom	Often	Very Often	Always
8. I ask others for advice	O	O	O	O	O
9. I review (rethink) my goals or plans	O	O	O	O	O
10. I take my feelings out on others physically (e.g. fighting, lashing out)	O	O	O	O	O
11. I put the situation into perspective	O	O	O	O	O
12. I concentrate on a pleasant activity	O	O	O	O	O
13. I try to make others feel bad (e.g. being rude, ignoring them)	O	O	O	O	O
14. I think about people better off and make myself feel worse	O	O	O	O	O
15. I keep the feeling locked up inside	O	O	O	O	O
16. I plan what I could do better next time	O	O	O	O	O
17. I bully other people (e.g. saying nasty things to them, hitting them)	O	O	O	O	O
18. I take my feelings out on objects around me (e.g. deliberately causing damage to my house, school or outdoor things)	O	O	O	O	O
19. Things feel unreal (e.g. I feel strange, things around me feel strange, I daydream)	O	O	O	O	O
20. I telephone friends or family	O	O	O	O	O
21. I go out and do something nice (e.g. cinema, shopping, go for meal, meet people)	O	O	O	O	O

Appendix D

CERQ

© Garnefski, Kraaij & Spinhoven, 2001

How do you cope with events?

Everyone gets confronted with negative or unpleasant events now and then and everyone responds to them in his or her own way. By the following questions you are asked to indicate what you generally think, when you experience negative or unpleasant events

	(almost) never	some-times	regu-larly	often	(almost) always
1. 1 feel that I am the one to blame for it	1	2	3	4	5
2. I think that I have to accept that this has happened	1	2	3	4	5
3. I often think about how I feel about what I have experienced	1	2	3	4	5
4. I think of nicer things than what I have experienced	1	2	3	4	5
5. I think of what I can do best	1	2	3	4	5
6. I think I can learn something from the situation	1	2	3	4	5
7. I think that it all could have been much worse	1	2	3	4	5
8. I often think that what I have experienced is much worse than what others have experienced	1	2	3	4	5
9. I feel that others are to blame for it	1	2	3	4	5
10. I feel that I am the one who is responsible for what has happened	1	2	3	4	5
11. I think that I have to accept the situation	1	2	3	4	5
12. I am preoccupied with what I think and feel about what I have experienced	1	2	3	4	5
13. I think of pleasant things that have nothing to do with it	1	2	3	4	5
14. I think about how I can best cope with the situation	1	2	3	4	5
15. I think that I can become a stronger person as a result of what has happened	1	2	3	4	5
16. I think that other people go through much worse experiences	1	2	3	4	5
17. I keep thinking about how terrible it is what I have experienced	1	2	3	4	5
18. I feel that others are responsible for what has happened	1	2	3	4	5
19. I think about the mistakes I have made in this matter	1	2	3	4	5
20. I think that I cannot change anything about it	1	2	3	4	5
21. I want to understand why I feel the way I do about what I have experienced	1	2	3	4	5
22. I think of something nice instead of what has happened	1	2	3	4	5
23. I think about how to change the situation	1	2	3	4	5
24. I think that the situation also has its positive sides	1	2	3	4	5
25. I think that it hasn't been too bad compared to other things	1	2	3	4	5
26. I often think that what I have experienced is the worst that can happen to a person	1	2	3	4	5
27. I think about the mistakes others have made in this matter	1	2	3	4	5
28. I think that basically the cause must lie within myself	1	2	3	4	5
29. I think that I must learn to live with it	1	2	3	4	5
30. I dwell upon the feelings the situation has evoked in me	1	2	3	4	5
31. I think about pleasant experiences	1	2	3	4	5
32. I think about a plan of what I can do best	1	2	3	4	5
33. I look for the positive sides to the matter	1	2	3	4	5
34. I tell myself that there are worse things in life	1	2	3	4	5
35. I continually think how horrible the situation has been	1	2	3	4	5
36. I feel that basically the cause lies with others	1	2	3	4	5

Appendix E

RBQ-A

In this questionnaire we are interested in whether certain events have happened to you in the **PAST MONTH**. Please indicate how often the following events have happened to you in the **PAST MONTH**.

Scale: (0) Never
        (1) Almost Never (1 Time Per Month)
        (2) Sometimes (2-4 Times Per Month)
        (3) Almost Always (2-3 Times Per Week)
        (4) Always (4 or More Times Per Week

		Never	Almost Never	Sometimes	Almost Always	Always
1.	Have you destroyed property (other than your own)?	1	2	3	4	5
2.	Have you been unfaithful to your boyfriend or girlfriend?	1	2	3	4	5
3.	Have you been in a physical fight?	1	2	3	4	5
4.	Have you bullied, threatened, or intimidated a peer(s)?	1	2	3	4	5
5.	Have you been binge drinking and/or drinking to get drunk?	1	2	3	4	5
6.	Have you used illegal drugs?	1	2	3	4	5
7.	Have you sold illegal drugs?	1	2	3	4	5
8.	Have you skipped class (or entire days of school)?	1	2	3	4	5
9.	Have you cheated or plagiarized?	1	2	3	4	5

		Never	Almost Never	Sometimes	Almost Always	Always
10.	Have you shoplifted?	1	2	3	4	5
11.	Have you stolen money?	1	2	3	4	5
12.	Have you had unsafe sex?	1	2	3	4	5
13.	Have you verbally harassed someone?	1	2	3	4	5
14.	Have you made attempts to cut or burn yourself?	1	2	3	4	5
15.	Have you purged or binged?	1	2	3	4	5
16.	Have you gambled?	1	2	3	4	5
17.	Have you lied to your family members (e.g., grandparents, parents, siblings)?	1	2	3	4	5
18.	Have you driven (a bicycle, a moped, and/or a car) recklessly (e.g., at fast speeds, under the influence of a substance)?	1	2	3	4	5
19.	Have you used cigarettes?	1	2	3	4	5
20.	Have you engaged in acts of revenge?	1	2	3	4	5