

2015

The role of psychological flexibility in the emotional and social well-being of adolescents

Sunila Supavadeeprasit
University of Wollongong

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THE ROLE OF PSYCHOLOGICAL FLEXIBILITY IN THE EMOTIONAL AND SOCIAL WELL-BEING OF ADOLESCENTS

A dissertation submitted in partial fulfilment
of the requirements for the award of the degree
Doctor of Philosophy (Clinical Psychology)

from the

University of Wollongong

By

Sunila Supavadeeprasit

School of Psychology

Faculty of Social Sciences

2015

Certification

I, Sunila Supavadeeprasit, declare that this thesis, submitted in partial fulfilment of the requirements for the award of the degree of Doctor of Philosophy (Clinical Psychology), in the School of Psychology, University of Wollongong, is wholly my own work unless otherwise referenced or acknowledged. The document has not been submitted for qualifications at any other academic institution.

Sunila Supavadeeprasit

Date: August 30, 2015

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Acknowledgement

I would like to express my sincere gratitude to my supervisor, Professor Frank Deane, for his unfailing support, guidance, feedback, and most of all patience during the completion of my thesis. I would also like to thank Professor Patrick Heaven and Professor Joseph Ciarrochi for their initial support when I started my PhD journey.

I would also like to thank the Catholic Education Office for providing us the opportunity to conduct our surveys each year. I especially thank the students of the Catholic Schools who participated in the research and the teachers who organized the venue each year.

I owe my sincerest gratitude to my parents because without their unconditional love and support, I would not have been able to embark on this journey and complete it. I also owe my dearest friend, Michael John Davey, a big thank you for all the emotional support and encouragement that he gave me during my struggles through the years on this journey.

Finally, I dedicate this PhD to the memory of my beloved friend and spiritual master, Shri Parthasarathi Rajagopalachari, who quietly inspired me from within and who gave me the strength and courage to overcome the obstacles that I faced in my life's journey. I could not have completed this PhD without his nourishing love and attention in my spiritual well-being.

Abstract

Research on adolescent coping suggests that the link between stressors and adolescent psychopathology lies in the coping style employed (Dumont & Provost, 1999; Lazarus & Folkman, 1987; Seiffge-Krenke, 2000). Psychological flexibility (PF) is a construct that is a form of coping and is increasingly being seen as an emotion regulation construct and a psychological vulnerability in the development of a range of psychological disorders (Boulanger, Hayes, & Pistorello, 2010; Kashdan, Barrios, Forsyth, & Steger, 2006). High PF employs mindfulness/acceptance strategies in the service of value-consistent behaviours. On the other end of the continuum, low PF involves avoidance/suppression strategies in the regulation of emotions, cognitions, and behaviour (Hayes, Strosahl, & Wilson, 1999). Low levels of PF have been shown to be significantly associated with psychological distress, deficits in functioning, and deficits in relating towards oneself and others (Berrocal, Pennato, & Bernini, 2009). Various emotion regulation strategies used by adolescents can be conceptualized to involve processes inherent in PF (Hughes & Gullone, 2011; Neumann, van Lier, Gratz, & Koot, 2010; Silk, Steinberg, & Morris, 2003). Psychological flexibility is particularly relevant during adolescence since it is a period when adolescents are prone to experience high levels of negative emotions, low levels of positive emotions, and significant changes in their social support network (Helsen, Vollebergh, & Meeus, 2000; Henker, Whalen, Jamner, & Delfino, 2002). Decreases in PF have the potential to adversely influence the experience of negative and positive emotions and perceptions of social support. Reciprocal relationships between PF, specific emotions, and perceived social support (PSS) have not been investigated longitudinally before. The longitudinal relationship between these variables has the potential to contribute to a better understanding of precursors in the development and maintenance of psychological disorders in adolescence. This thesis examines the relationship between PF and specific emotions and between PF and PSS in adolescents in a two-wave longitudinal study and explores the temporal relationship between these variables.

Participants were 884 adolescents drawn from an on-going longitudinal study investigating social and emotional well-being. Students were surveyed in the second term of their third and fourth years (Year 9 and Year 10) of high school. The variables assessed in this study included PF, five

specific emotions (fear, hostility, sadness, shame, and joy), and perceived quality and quantity of social support (PSS). Structural equation modelling (SEM) analyses were used to assess the measurement structure of the variables and a SEM cross-lagged design was used to determine the antecedent, consequence, or reciprocal relationships between (i) PF and each emotion and (ii) PF and quality and quantity of social support.

Psychological flexibility was found to be a precursor to hostility but emotions including sadness and shame were precursors of psychological flexibility. No relationship was found between PF and joy. Additionally, a reciprocal relationship was found between PF and fear. Further analyses were conducted to investigate the strength of the reciprocal relationship and it was found that PF was a stronger predictor of fear than fear was of PF. Psychological flexibility was found to be a precursor of both quality and quantity of perceived social support. Gender did not moderate any of the longitudinal relationships.

The findings in this study demonstrate that individual differences in the regulation of emotions were determined by specific emotions. Specific emotions determine when regulatory efforts (i.e. PF in this case) will exert its influence, irrespective of valence of the emotion. For some emotions, such as hostility and fear, the role of PF was that of a psychological vulnerability, while for some emotions, such as sadness and shame, PF processes were used to modulate the emotions. The observed relationships between PF and each emotion were most consistent with the differential emotions theory (DET; Izard, 2010) and the appraisal theories of emotions (Lazarus, 1991; Roseman, 1984) that assert that the interplay of emotional components in each emotion determines its regulation. Additionally, emotions of the same valence were found to recruit regulation at different points in the emotion generation process model, i.e before an emotion is triggered and after an emotion has been generated (Gross, 1998), suggesting that it is important to consider regulatory processes in the context of the emotion being regulated rather than only in the context of its adaptive or maladaptive consequences. Further, the finding that PF is a precursor of PSS suggests that the willingness to be open and accepting acts as a prerequisite for higher numbers of people in adolescents' social networks and higher levels of satisfaction with social networks. Future research

should focus on longitudinal studies with multiple time points while also considering adding measures of psychological outcomes so that mediating and moderating effects between PF, emotions, PSS, and psychological outcomes such as depression and anxiety can be determined. The current study has advanced theoretical knowledge that specific emotions are important to consider in emotion regulation and that the ability to regulate emotions effectively determines PSS. Additionally, a further understanding of the role of mindful emotion regulation in the emotion generation process model has been gained. The results of this study have implications for future studies investigating emotions and emotion regulation.

Chapter 1: Overview

1.1 Purpose of Thesis

Research evidence suggests that three factors consistently emerge as significant markers of risk in adolescence and contributes to the maintenance of psychological disorders. These factors are negative and positive emotions, perceived social support (PSS), and emotion regulation (ER) (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Cohen, 2004; Lengua, 2002; Michl, McLaughlin, Shepherd, & Nolen-Hoeksema, 2013). Each factor and its importance are elaborated below.

Emotional feeling states are an important aspect of life as they play a key role in the evolution of consciousness, provide motivational information, and prompt people to act when necessary (Izard, 2009). Emotions are inherently adaptive feeling states but they can become maladaptive and can lead to psychological difficulties. Research suggests that maladaptive negative emotional states and deficits in positive emotional states contribute to a large percentage of the symptoms in psychiatric disorders such as anxiety and depression. Research in specific emotions has grown exponentially but emotion theorists are still mired in theoretical debates about the importance of examining specific emotions versus examining the two broad emotional dimensions consisting of negative and positive affect. Discrete emotion theorists suggest that each emotion is different because the interplay between emotional components (e.g. cognitions, physiology, action tendencies etc.) has different adaptive and functional purposes, irrespective of valence. Although it is clear that specific emotions are distinct, there is a lack of clarity in whether specific emotions of the same valence are regulated similarly. Research has shown that the ability to identify, describe, and differentiate between specific emotions is an important first step in recognizing how to cope effectively (Feldman Barrett, Gross, Christensen, & Benvenuto, 2001).

Social support is known to be an important protective factor and is one of the key predictors of happiness, health, and even mortality (Cacioppo & Cacioppo, 2014). Perceived social support is an indication of the perceived quantity of people available in an individual's social network and the perceived quality of those social relationships. Substantial evidence suggests that the positive perception of social support is a significant protective factor against stress while the negative perception of social support is a significant risk factor that broadly affects mental and physical well-being across the life-span (Cacioppo & Cacioppo, 2014; Cornwell, 2003). More recently, social support has been proposed in light of an interpersonal ER variable, suggesting the extent to which people are likely to rely on their external social support networks for regulating purposes (Marroquin, 2011).

Emotion regulation is increasingly being considered a developmental task that improves and becomes more refined during adolescence. Different ER strategies used for regulating emotions and managing social relationships often determine whether they are adaptive or maladaptive. Research indicates that individual differences in ER predict personality development and social competence (Kochanska, Murray, & Harlan, 2000), are essential for the development of theory of mind (Izard et al., 2011), and contributes to school success and cognitive growth (Macklem, 2008). Additionally, difficulties in ER have been found to play a central role in the emergence and maintenance of psychological disorders (Kring & Sloan, 2009). Emotion regulation can be considered an important risk factor particularly during adolescence as adolescents experience greater variability and intensity in emotional states and react more strongly towards emotional stimuli when compared to children and adults (Larson & Lampman-Petratis, 1989; Larson & Richards, 1994; Silk et al., 2009; Tottenham, Hare, & Casey, 2011). The ability to regulate emotions effectively is essential for well-being across the life-span.

Despite the exponential growth in ER research, there is still a lack in conceptual clarity of the construct. The wide range of ER strategies renders it more difficult to define and this has resulted in ambiguity in what constitutes ER (Lougheed & Hollenstein, 2012). Currently,

research evidence is suggesting that rather than focusing on different ER strategies, it is more beneficial to focus on underlying ER processes. Research is increasingly showing that underlying ER processes can be more meaningful in showing how people access and deploy different regulatory strategies across a variety of contexts. Regulatory flexibility constitutes underlying ER processes in emotional self-regulation that has been shown to predict future well-being while controlling for previous levels of well-being and cognitive abilities (Bonanno et al., 2004). But even flexible ER processes depend upon emotional awareness that has been referred to as attentional processes that are important for recognizing emotional arousal and differentiating between emotional experiences and its regulation (Lambie & Marcel, 2002). In this regard, mindfulness has emerged as a construct that engenders qualities of awareness while also promoting regulatory flexibility processes. On the other hand, the opposite of mindfulness consists of avoidant ER processes that have been shown to inhibit the functional and adaptive nature of emotions. A mindful approach as an alternative to conventional ER responding approaches is widely being accepted but research is still lacking in how mindfulness approaches act as an ER construct in relation to the object it is regulating, (i.e. emotions).

Emotions, perceived social support, and ER have been identified as potent risk and protective factors in adolescence and their influence on each other potentially plays a role in different disorders and in overall well-being (Kraemer, Stice, Kazdin, Offord, & Kupfer, 2001). In fact, findings from studies have shown that correlations between these risk and protective factors are high and that the intercorrelations between them are linked to the maintenance of psychological disorders, such as depression and anxiety (Carver, Scheier, & Weintraub, 1989; Chao, 2011; Lengua, 2002). Currently, there is limited research that has examined how these specific risk and protective factors influence each other in normal populations. Despite the explosion of research in ER in the past two decades, there seems to be a lack of clarity in the relationship between ER and specific emotions. Additionally, although research in emotional development has suggested that emotion self-regulation is important for the development of social competence, little research has examined the role of ER in social experiences of

adolescents, particularly in the way social support is perceived. Such gaps in the ER literature continue to undermine progress in improving conceptual clarity. The main gaps in the literature are varied and are discussed accordingly in the following paragraphs.

First, ER models have not taken into consideration discrete emotion theories, thereby contributing to an unclear understanding of mechanisms that influence the very object they are regulating. The bulk of studies that have examined ER and emotions have mainly focused on the dimensional models of affect (i.e., positive and negative affect), or they have used measures of distress such as depression, anxiety, or anger to represent a whole range of emotional experiences (Power, 2006). The larger part of emotion theories, such as the discrete emotion models, have been consistently ignored. Discrete emotion models range from simple and basic physiological and behavioural models to more complex models of cognition and judgment and therefore discrete emotions are likely to be regulated differently. More specifically, discrete emotions are usually associated with a causal object and this has important consequences for ER in the form of greater emotion knowledge in comparison to global affective states where emotional components are not targeted (Russell & Feldman Barrett, 1999).

Second, the majority of ER models have mainly focused on self- models of ER while external models of ER have largely been ignored. Self-models of ER are mainly concerned with the individual's ability to use intrapersonal (intrinsic) resources to regulate emotions but people often also rely on others in their social network to help them regulate emotions (Campos, Walle, Dahl, & Main, 2011). The perception of the amount of social support (i.e. number of people in social support network) and satisfaction with these supports provide a good indication of how much people involve supportive others in their personal lives and possibly implicitly obtain help with regulation (Marroquin, 2011). Past research in determining the link between intrapersonal ER strategies and social support has been scant and there is little information on how these different modes of ER influence each other.

Third, studies investigating ER have been conducted unsystematically and this has contributed to an unclear understanding of which behaviours constitute ER. In addition to the

issue of the lack of ER investigations being grounded in discrete emotion theories, the fragmented investigation of ER behaviours has also introduced ambiguity in determining how regulation works. The accumulated studies have examined a multitude of ER strategies that range from usage of short term strategies (e.g. suppression, avoidance) to long term strategies that involve regulatory attitudes such as emotional acceptance. But the majority of studies have examined one or two ER strategies to demonstrate individual behavioural response tendencies. This ignores the full scale of an emotional experience whereby a majority of individuals engage in a variety of ER behaviours according to the demands of the context in conjunction with their personal predisposition. As a result, very little research has been devoted to investigations of individual differences in ER flexibility.

Fourth, gender differences in specific emotional experiences and perceived social support remain inconclusive. Although evidence from many studies have shown that girls tend to be more depressed than boys (Zeman & Garber, 1996) and boys tend to be more hostile than girls (Hart, 1999), these differences have not been consistent across the studies (Calvete, Orue, & Hankin, 2013). Similarly, research shows that girls seem to be more receptive to positive social support than boys but inconsistencies have been found among these studies too (for e.g. Allen & Stoltenberg, 1995). Moreover recent research has shown that gender differences in the use of ER strategies have not been uniformly consistent across empirical investigations as males and females tend to use different strategies for regulating emotions (see review by Nolen-Hoeksema, 2012). Overall, it is still unclear as to whether gender differences play a role in any of these risk factors.

In an attempt to address the gaps in the literature, the purpose of the current study was to (1) examine the longitudinal relationship between psychological flexibility, a behavioural mindfulness and acceptance-based ER variable, and discrete emotions (i.e. fear, hostility, sadness, shame, and joy); (2) examine the reciprocal relationship between intrapersonal ER and interpersonal ER using a longitudinal design; (3) assess whether any gender differences exist in the relationships in (1) and (2).

1.2 The Current Study and Rationale

This study investigated the longitudinal relationship between emotional and social experiences and emotion regulation during mid-adolescence. In the current study, specific negative and positive emotions, such as fear, hostility, sadness, shame, and joy were used to operationalize emotional experiences. Social experiences were operationalized by perceived social support (PSS). Perceived social support is a measure comprised of the perceived quantity of people available for support and satisfaction with those supports. Emotion regulation was operationalized by using the psychological flexibility (PF) measure for adolescents called the Action and Fusion Questionnaire for Youth (AFQ-Y; Greco, Baer, & Lambert, 2008).

The aim of the present study was to explore potential reciprocal influences (i.e. “the effect of two or more variables on each other over time”; Hamaker, Kuiper, & Grasman, 2015, p. 103) between PF and emotional and social experiences in a two-wave study by using a structural equation modelling approach called the cross-lagged longitudinal panel design. In a cross-lagged panel design, the same variables are assessed repeatedly over time and this provides a means for gauging the stability of the constructs over time and for determining whether any changes in one variable has predictive change effects on changes in another variable. Latent constructs ensure that measurements are a reflection of the latent trait as they are corrected for measurement error (any parts of the variables measured that are not a part of the true construct such as the situation or person-situation interactions on the occasion of testing; Steyer, Schmitt, & Eid, 1999) that might influence the reliability of measurement, and the method used to construct latent variables have the ability to establish content, criterion, and construct validity (Little, 2013). In this study, the variables were measured a year apart approximately at the same time each year. Furthermore, for each relationship the moderating influence of gender was also explored. Girls and boys are known to experience different emotions more intensely but they may also experience some emotions in a similar manner. For example, girls and boys may experience sadness and anger differently but they may experience shame in the same way. Further, gender differences in perceived social support and PF have been inconclusive so far

and therefore this study has the potential to provide further clarity for these variables. The current study is exploratory in nature and the rationale is presented below.

Psychological flexibility is a multidimensional construct that consists of six interrelated psychological processes including acceptance, present moment awareness, defusion, self-as-context, and committed action (Ciarrochi, Sahdra, Marshall, Parker, & Horwath, 2014; Gamez, Chmielewski, Kotov, Ruggero, & Watson, 2011). The PF construct measures two ends of a continuum in which high PF consists of acceptance and contact with present moment processes while low PF is concerned with processes that involve rigid avoidance (i.e. cognitive fusion and experiential avoidance) of private events including thoughts, feelings, memories, sensations etc. Processes inherent in PF are considered behavioural dispositions or trait-like as these behaviours are often learned in the early years of life and continue to influence behavioural outcomes throughout life.

The bulk of studies examining PF have reported high correlations between low PF and a range of psychological symptoms and disorders (Hayes et al., 2006; Ruiz, 2010). This has led to extensive research in understanding the involvement of PF in the development of psychological symptoms and consequently its role in the treatment of psychological disorders. Moreover, recent empirical research is suggesting that PF acts as a transdiagnostic factor across a range of diagnostic categories (Levin et al., 2014). This has led to the emergence of PF as a mechanism of change whereby changes in outcome variables (for e.g. clinical symptoms and workplace-related productivity) have been shown to be fully or partially mediated by changes in PF in clinical and non-clinical populations. The mediational influence of PF indicates that PF plays an important role in the development and maintenance of psychological symptoms and that coping through processes inherent in low PF further contributes to adverse emotional and social outcomes above and beyond the initial direct influence of other risk factors or stressors on the outcome. The mediational role of PF has been examined in intervention studies for a variety of psychological difficulties, i.e. before and after delivery of PF-enhancing treatment protocols including at follow-up stages (for e.g. Bond & Bunce, 2000; Gifford et al., 2004; Gregg et al.,

2007; Lundgren, Dahl, & Hayes, 2008), and in survey studies seeking to understand the contribution of psychological flexibility alongside other coping and emotion regulation strategies, biological (e.g. pain or injury; Orcutt, Pickett, & Pope, 2005) psychosocial stressors (e.g. anxiety sensitivity, childhood sexual abuse; Marx & Sloan, 2002; Reddy, Pickett, & Orcutt, 2006), and temperamental factors (e.g. emotional reactivity; Kashdan et al., 2006; Masuda et al., 2009) in predicting outcome variables such as depression and the various anxiety disorders (e.g. PTSD, trait anxiety; Kashdan, Morina, & Priebe, 2007). Accumulated evidence from studies investigating the mediational role of PF has increasingly shown that PF acts as underlying emotional regulatory processes and also acts as a psychological vulnerability (Levin et al., 2014).

The only problem with these mediational studies is that the majority of them have used cross-sectional designs, which are limited in determining directional pathways (for e.g., Kashdan & Breen, 2007; Kashdan et al., 2007). Cross-sectional studies can provide a great advantage over longitudinal studies when there are funding and time constraints. But cross-sectional mediation studies can suffer from design disadvantages. For example, in the cross-sectional mediation studies examining PF processes, it could only be demonstrated that changes in PF had occurred but it was not possible to determine which variable influenced the other or which variable preceded the other variable because the changes occurred at the same time as changes in specific outcomes. Even though PF contributed to the development of psychological symptoms, it could very well also be true that psychological symptoms contributed to the development of PF, or the lack thereof. However, a few intervention studies have shown that changes in PF preceded changes in the mediated variable, but the number of studies remain small (for e.g., Gifford et al., 2004; Hesser, Westin, Hayes, & Andersson, 2009; Zettle & Hayes, 1986). Additionally, a few short and longer term longitudinal studies have also demonstrated that PF acts as a risk factor/vulnerability for the future development of psychological difficulties (Bond & Bunce, 2003; Hayes et al., 2004; Marx & Sloan, 2005). At present, it is unclear as to how PF contributes to adverse outcomes or well-being based on the current research evidence.

Therefore, the current study was undertaken to gain a better understanding of the role of PF in relation to other risk factors such as negative and positive emotions and perceived social support.

The rationale for examining PF and negative and positive emotions and PF and social support stems primarily from the multidimensional aspect of the PF construct. The basis for the rationale is showcased through (1) current empirical research in discrete emotion theories and ER (2) existing theoretical debates about emotions and ER, and (3) current theoretical and empirical research in intrapersonal and interpersonal ER.

Empirical findings have emphasized the role of negative and positive affect in psychopathology in conjunction with the pervasive use of avoidant coping in the adolescent coping and ER literature. Research has shown that high levels of negative affect and low levels of positive affect pose as vulnerabilities for the emergence of affective pathology in children and adolescents (Barlow, Chorpita, & Turovsky, 1996; Clark & Watson, 1991). The tripartite model suggests that negative affect is a common factor shared by anxiety and depression while low levels of positive affect or anhedonia is a characteristic specific to depression and physiological hyperarousal is a unique feature of anxiety (Clark & Watson, 1991). In clinical and nonclinical populations of children and adolescents, several studies have found that negative affect explained considerable overlap between anxiety and depression, while positive affect or anhedonia was found to be unique in depression (Chorpita, 2002; Joiner, Catanzano, & Laurent, 1996; Laurent & Ettelson, 2001; Lonigan, Carey, & Finch, 1994). Although research indicates that high levels of negative affect and low levels of positive affect render adolescents vulnerable to psychological disorders, very little research has been devoted to understanding the nature of specific emotions and how they may contribute to psychological difficulties in adolescents. Specific emotions are especially relevant as research is increasingly suggesting that the ability to identify and describe different emotions and the capacity to differentiate among them is an important first step in recognizing how to cope with emotions effectively (Kashdan & Barrett, 2015).

It has also been argued that intense and fluctuating experiences of emotions during adolescence is characteristically inevitable during this developmental stage and that the majority of adolescents seem to proceed through this developmental stage with relative ease and appear to be comparatively free from significant emotional or social problems (Larson & Ham, 1993; Laursen, Coy, & Collins, 1998; Steinberg, 2001). But research has demonstrated that mid to late adolescence can be a low point for adolescents as they are susceptible to considerably increased levels of negative affect and decreased levels of positive affect (Larson et al., 2002). Emotion-related changes during adolescence are unquestionably inevitable due to biological changes (e.g., pubertal and cognitive maturity) that can vary widely between individuals. And the resulting changes can continue to be an influence on behavioural outcomes later in adulthood (see Hollenstein and Loughheed, 2013 for review). Moreover, poor coping skills learned during the mid-adolescence stage can have ongoing detrimental effects and has also been shown to further influence mental health in emerging adulthood.

Accumulated research has shown that the coping style employed explains the link between negative and positive affect and adverse outcomes in adolescents (Dumont & Provost, 1999; Lazarus & Folkman, 1984; Seiffge-Krenke, 2000). Research has shown that advanced skills in coping and ER often develop and become more refined during adolescence and therefore those with poor coping skills are prone to develop depressive symptoms (Eastabrook, Flynn, & Hollenstein, 2014). Among the various adolescent stages, mid-adolescents are particularly at risk of developing psychological problems due to developmental transitions from early to mid-adolescence. Accumulated evidence suggests that adolescents predominantly use rigid forms of avoidant emotion regulation strategies to cope with emotional symptoms of anxiety and depression. Both cross-sectional and longitudinal studies have pointed to the pernicious effects of avoidant strategies in emotional and behavioural problems in adolescents (Aldridge & Roesch, 2008; Asarnow, Carlson, & Guthrie, 1987; Compas, Malcarne, & Fondacaro, 1988; Ebata & Moos, 1991; Flouri & Mavroveli, 2013; Garnefski, Kraaij, & van Etten, 2005; Herman-Stahl, Stemmler, & Petersen, 1995; Seiffge-Krenke, 1993, 1995; Silk et al., 2003).

Additionally, in more recent research of positive affect and its link with psychological disorders, it has been suggested that the possible experience of low levels of positive mood states could be attributed to avoidant forms of coping. The attempt to avoid negative affect could possibly suppress the experience of positive affect and this can contribute to psychological symptoms as seen in anhedonia, social anxiety, bipolar disorder, externalizing disorders, and eating disorders in adolescents (Gilbert, 2012). Despite the importance of negative and positive affect and avoidant forms of coping as correlates of adverse psychological outcomes, comparatively little research has used a multidimensional measure such as PF to explore its role in regulating specific negative and positive emotions. The two ends of the PF continuum serve as means to explore the reciprocal relationship between specific emotions and PF. Conceptually, the PF construct is suggested to represent the ability for flexible behaviour even in the presence of unwanted emotions, irrespective of their intensity and valence, and therefore PF is likely to enhance the functional and adaptive nature of emotions. In other words, if a person is psychologically flexible, then it would not matter which emotion is being experienced as flexible coping behaviour would eventually lead to adaptation. However, when a person is psychologically *inflexible*, then attempts to avoid, escape or control unwanted emotions predominate and people also become entangled with the interpretation of the emotion(s) itself, and this can eventually lead to maladjustment. The avoidance of emotions can inhibit the unfolding of emotional processes, which contain important adaptive information about the emotion. Therefore, reciprocal relationships between PF and specific emotions in the context of psychological *inflexibility* are important in elucidating the significance of specific emotions. These relationships could be used to inform and guide investigations of ER processes in future research.

The reciprocal relationships between PF and specific emotions also has the potential to clarify some of the existing debates in the literature regarding emotions and ER and potentially lends further support to the investigation of a multidimensional ER variable and its role in specific emotions. Some researchers argue that emotions and ER are facets of a single process

(Campos, Frankel, & Camras, 2004; Kappas, 2011) whereas other researchers claim that emotions and ER are separate constructs (Cole, Martin, & Dennis, 2004; Gross & Barrett, 2011; Thompson, 2011). This debate is important in relation to the design and focus of investigation in this study as emotions and ER have been modelled as separate factors. According to the single factor argument, emotions and ER are not a linear process as emotions can either be elicited first and then attempts to modulate can follow or regulatory responses (e.g. personal goals, hedonics, or emotional communication) can dictate the generation of an emotion (Campos et al., 2004). The single factor model is reflected in Gross's (1998) emotion generation process model where ER processes can determine the elicitation of emotions (antecedent-focused) or emotions can trigger ER responses (response-focused). But at the same time, there is value in investigating emotions and ER processes separately as they serve other benefits. With regard to this study, for example, there is value in separating the constructs so that individual differences in understanding the role of PF in specific emotions can be determined, which in turn can provide a better understanding of whether emotional processes should be separated as two factors instead of one. Moreover, the examination of specific emotions in this debate is particularly relevant as the majority of past research has predominantly used dimensional scales, i.e. positive and negative affect, while emotions of the same valence are increasingly being shown to have distinct functions (Zimmermann & Iwanski, 2014). There is a possibility that reciprocal influences between emotions of the same valence and PF may be different and this could provide a basis for why emotions and ER should be examined as separate factors. Another important aspect to consider in this debate is the trait-like characteristic of the PF construct. There is a possibility that psychological *inflexibility* acts as a psychological vulnerability in the experience of specific emotions. Even though emotions can be experienced in one moment and attempts to regulate can be immediate, people who are already low in PF will often tend to use the same patterns of behaviour in regulating emotions as these have been learned and used in their past (Healy, Barnes-Holmes, & Smeets, 2000; Lipkens et al., 1993; Roche et al., 2000).

The same longitudinal research design will be used to explore the relationship between PF and PSS based on the following theoretical and empirical reasoning. A theoretical notion that is gaining attention suggests that the regulation of emotions can be interpersonal (i.e., ER that occurs through the influence of social relationships or extrinsic processes) and intrapersonal (i.e. ER that occurs within an individual or intrinsic processes) and that both kinds of ER have the potential to improve understanding of mental health at the individual level (Campos, Walle, Dahl, & Main, 2011; Hofmann, 2014; Marroquin, 2011). In the past, the extensive research emphasis on intrapersonal ER has mostly been investigated independently from interpersonal ER or emotion-regulatory processes that involve the effects of the social environment (Marroquin, 2011). Consequently, very little research has examined the relationship between the two kinds of ER. In this study, PSS was used to represent interpersonal ER and PF was used to represent intrapersonal ER. The links between these two variables are largely supported by independent literatures.

Perceived social support has been proposed to portray a key aspect of interpersonal ER (Marroquin, 2011). PSS is thought to capture the effects of the social environment and the quality of interpersonal relationships as it considers recipient awareness and evaluation of the availability and quality of social support. Adolescents with positive perceptions of social support generally tend to report better well-being while those with negative perceptions of social support report greater feelings of distress or depression (Cornwell, 2003). Similarly PF can be considered as intrapersonal attempts that involve attentional awareness or avoidance of awareness to internal private events such as thoughts, emotions, memories, images, physical sensations etc. Individuals high in PF have attentional awareness of the ongoing stream of inner cognitive and emotional responses and are therefore able to adapt their behaviour to ongoing changes in the environment while those who are low in PF use inattentive avoidant strategies to divert their attention from present moment awareness. Both PF and PSS have established links with depression but the processes involved in how PF is associated with depression has been more clearly explained through theoretical and empirical studies while ER processes that may

influence PSS ,which in turn might influence depression are still unclear (e.g., Ciarrochi, Deane, Wilson, & Rickwood, 2002; Ciarrochi, Wilson, Deane, & Rickwood, 2003). A good place to begin to understand the influences of PSS on depression and possibly other forms of psychopathological outcomes in adolescence would be to extend our understanding of the relationship between PSS and a multidimensional intrapersonal variable such as PF. Prior research suggests that those who have low levels of PF are more likely to experience interpersonal problems due to the tendency to avoid distress in social situations (Gerhart, Baker, Hoerger, & Ronan, 2014). It is possible that the PF construct may explain negative or positive evaluations and expectations involved in PSS. Additionally, the examination of the temporal relationship between PSS and PF is likely to provide a better understanding of the connection between interpersonal and intrapersonal processes involved in influencing both positive and negative outcomes during adolescence. Moreover, this study could provide some insight on factors that influence interpersonal relationships during adolescence.

Relationships among these risk factors have the potential to provide a better understanding of the development and maintenance of psychological disorders that tend to commence during adolescence (Cisler, Olatunji, Feldner, & Forsyth, 2010) and at the same time provide basic guidance for future research in this area. The degree to which individuals are psychologically flexible has the potential to influence the experience of different emotions and enable individuals to differentiate between them. Similarly, PF has the potential to influence perceptions of social support, which is an important first step in understanding what factors may have an effect on how adolescents perceive their social supports. Although studies have shown that PF is associated with emotionally and socially- related psychological variables, potential reciprocal relationships between PF and specific positive and negative emotions (fear, hostility, sadness, shame, and joy) and between PF and PSS has not been investigated before. It is still unclear as to how these variables affect each other during mid-adolescence over time. This thesis aims to address this significant research gap by exploring the longitudinal relationship between PF and each specific emotion and between PF and perceived social support.

In view of the discrete emotion theories, the assumed location of PF in the emotion generation process model, the developmental origins of PF, and the mediating role of PF, no a priori hypotheses favouring PF, specific emotions, or PSS as precursors are proposed. In addition, the moderating influence of gender was also explored given that gender differences in the experience of different emotions has been found in prior research. The following research questions were addressed:

Research Questions

- (i) Does greater PF contribute to more positive emotional experiences?
 - Will PF predict specific positive and negative emotions or will specific positive and negative emotions predict PF? Or will there be reciprocal relationships between PF and specific positive and negative emotions.
- (ii) Does PF influence the amount of and satisfaction with perceived social support?
 - Will PF predict PSS or will quantity of PSS predict PF?
 - Will PF predict the quality of PSS or will quality of PSS predict PF?
- (iii) Do boys and girls differ in the relationship between PF and specific emotions?
 - Does gender moderate the relationship between PF and each specific emotion?
- (iv) Do boys and girls differ in the relationship between PF and the amount of and satisfaction with PSS?
 - Does gender moderate the relationship between PF and quantity of PSS?
 - Does gender moderate the relationship between PF and quality of PSS?

1.3 Thesis Outline

This thesis contains 7 chapters. Chapter 2 contains three sections. The first section introduces a definition for emotions and further elaborates on the various components of emotions by exemplifying specific emotions. This section also provides an account of the differences between emotions and moods and emotions and affect. The second section establishes the theoretical underpinnings for the relationship between psychological flexibility and emotions based on the extant literature on emotion regulation and mindfulness. The third section provides the theoretical underpinnings for the relationship between psychological flexibility and perceived social support based on intrapersonal emotion regulation and interpersonal emotion regulation. In this chapter, current debates and supporting empirical studies are also presented to highlight the gaps in the literature.

Chapter 3 focuses on defining psychological flexibility and providing empirical evidence for the PF construct. Further supporting evidence has also been reviewed for psychological flexibility as a psychological vulnerability for a myriad of mental health problems. In addition, adolescent coping styles and emotion regulation strategies are reviewed with an emphasis on theoretical overlaps and distinctions with psychological flexibility.

Chapter 4 contains two sections. The first section focuses on emotional and social well-being as markers of risk in adolescence. At the beginning of this section, biological and social changes in adolescence are reviewed to highlight that these changes are unique in this developmental stage and are therefore likely to contribute towards emotional and social processes in adolescence. Further, the link between specific emotions and mental health and the links between perceived social support and mental health are established. The second section focuses on the role of psychological flexibility in the emotional and social well-being of adolescents.

Chapter 5 provides an overview of the methodology for the thesis. A description of the larger research project and the approach in conducting the study is provided. Some demographic details of the participants and the measures used for this study are also described.

Chapter 6 describes the results found. First, results for the preliminary analyses are provided. Second, longitudinal results are provided. Structural equation modelling was used to determine measurement invariance across gender and time, for evaluating the moderating effects of the structural models, and to determine the temporal status of psychological flexibility in relation to specific emotions and perceived social support.

Chapter 7 focuses on the significant findings of the longitudinal relationships between psychological flexibility and specific emotions and between psychological flexibility and perceived social support. Furthermore, limitations and clinical implications for prevention and intervention are discussed. Theoretical implications and recommendations for future research are also considered. The chapter ends with an overall summary and conclusion of the thesis.

Chapter 2: Theoretical Background: Emotions, Emotion

Regulation, and Perceived Social Support

In the following sections, the extant literature in emotions, emotion regulation, and perceived social support are reviewed. An attempt is made to understand the relationship between emotions and emotion regulation and between emotion regulation and perceived social support.

2.1 Emotions and Emotion Regulation

This section will first focus on emotions and then on emotion regulation. Emotion theorists have defined and described emotions in many ways. An attempt is made to capture the elusive nature of emotions in order to demonstrate some critical aspects of specific emotions. Emotions can be understood from many perspectives and disciplines as presented by the various theories of emotion. On the other hand, research from different cultures and different sub-disciplines in psychology indicate that emotions have some core functions and can be described with some core principles. The focus of this section will thus be concerned with the multi-componential aspect of specific emotions including affect, action readiness, appraisal, and physiology in differentiating each emotion. Further, differences between emotions and mood and emotions and affect are discussed.

In the section following emotion, various emotion regulation strategies are defined and differences among them are discussed. An attempt is made to understand the whole emotional response experience including kinds of emotional strategies and processes, emotional awareness, and the role of context or situation. Further, mindfulness and its role as an ER variable are explained. Finally, PF is introduced as a form of mindful emotion regulation and the role of PF in the emotion generation process model is described.

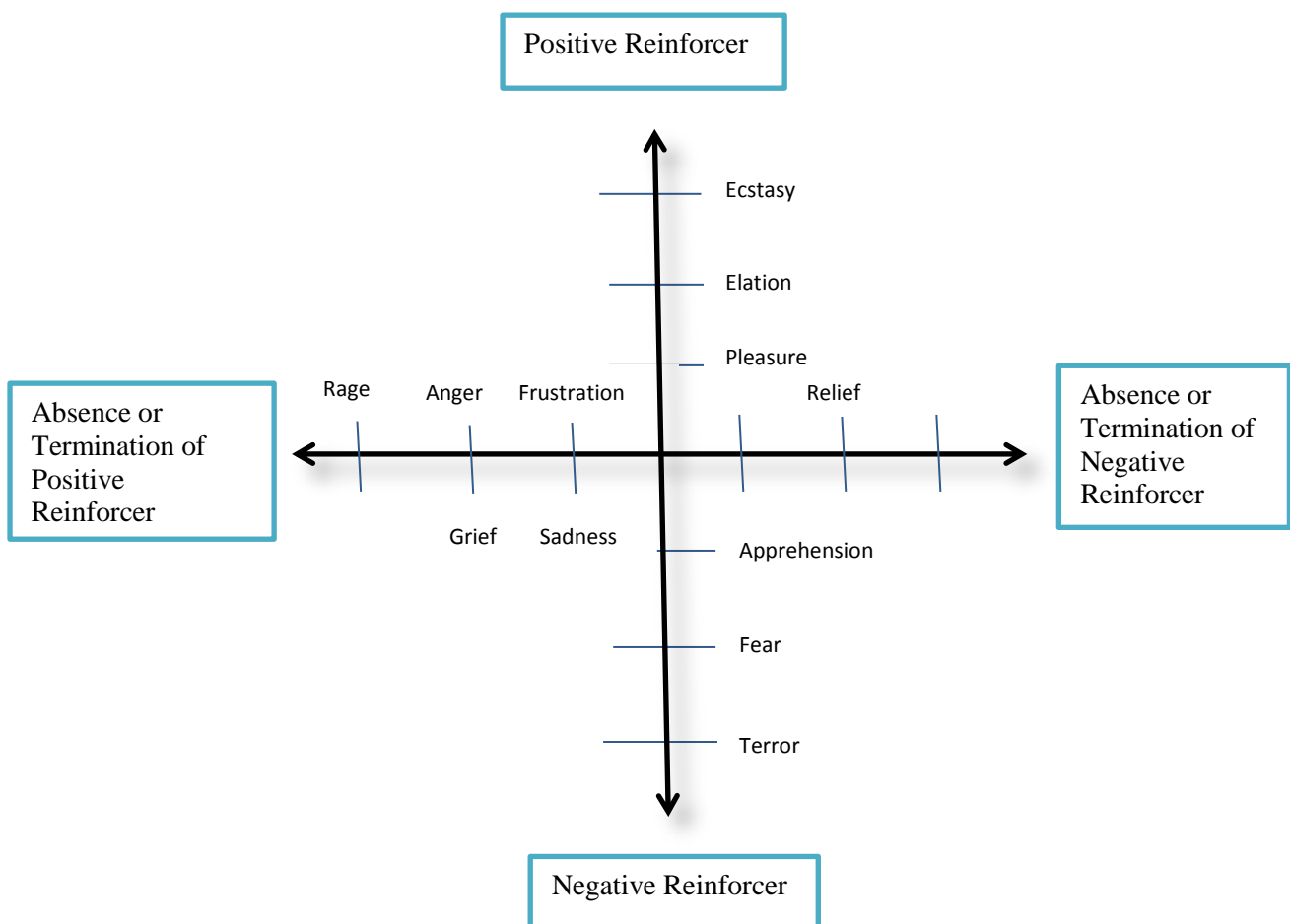
2.1.1 Emotion

The current conception of emotion is that human beings have emotions for adaptive purposes as opposed to earlier conceptions that emotions are disruptive and subordinate to reason (Salomon, 2000). The evolutionary role of emotions in the life of humans is an adaptive one as it provides a signal for readjustments and reorganizations to be made internally (i.e. cognition, judgment, behavioural, experience, and physiological) in response to environmental demands and opportunities (Frijda, 1988; Izard, 1971; Levenson, 1994; Kopp, 1989). Emotions are vital to human survival and well-being as they aid in preparing responses to potential threats (Damasio, 1999). Emotions also facilitate learning, judgment, and decision-making (Lerner & Keltner, 2000). The expression of emotion serves important attachment functions early in life and continues to facilitate social interactions in adulthood. Emotions can be viewed as a dynamic system that organizes biological and psychological subsystems to prepare the individual for responding to the environment.

Emotions have many functions in our daily lives as they occur due to many internal and external reinforcers. Figure 2.1 below, adapted from Rolls (2013), provides a depiction of the wide range of emotions and variations of emotions that can be experienced when they are associated with different reinforcement of contingencies. There is a variety of functions of emotions that range from autonomic responses to more goal-related conscious responses. Autonomic responses occur in conjunction with physiological changes, such as changes in heart rate or the release of adrenaline, which usually prepares the individual for action. Functions of emotions that are goal-related are responses to reinforcing stimuli that serve as motivators. Motivators can be evaluated as rewarding or punishing and this kind of learning provides flexibility in action. For example, humans can learn to obtain a reward or avoid a punishment just in one trial for the stimulus-reinforcer learning to occur. Additionally, the value that is given to emotions by the individual and the value that emotions serve in their social relationships can also be referred to as functions of emotions. Humans use emotions to communicate their feelings through facial expressions or other physical gestures (Ekman, 1993).

Similarly, emotions also function as a means of social bonding as with parents and their children or partners in a romantic relationship. From a cognitive perspective, emotions can function as cues for cognitive evaluations of events, may facilitate the storage of memories, and act as triggers for the recall of memories (Rolls, 2013).

Figure 2.1 Functions of discrete emotions-based contingencies of reinforcement



Accordingly, many definitions of emotions (a list of 92 definitions) have been proposed since the beginning of research on emotions (Kleinginna & Kleinginna, 1981). Based on the most prominent theoretical issues identified, these definitions were sorted into 11 categories: affective (phenomenal) experience, cognitive, physiological, expressive behaviour, disruptive, adaptive, multispect, restrictive, motivational, and its utility and status in science (Kleinginna & Kleinginna, 1981). The assortment of categories has further been used to explain the various aspects of emotions which are now known as emotion components (these are discussed in more

detail further below in this section). A definition of emotions should describe its purpose and function to the individual while emotion components provide information on a set of typical changes that are likely to occur when an emotion is experienced. From a functional perspective, Campos and colleagues have provided a practical definition of emotions as “processes of establishing, maintaining, or disrupting the relations between the person and the internal or external environment on matters important to the individual” (Campos, Campos, & Barrett, 1989, p. 395).

Emotions can be classified as basic and secondary in nature. Basic emotions include the natural kinds such as fear, anger, sadness, love, or joy whereas secondary emotions include self-conscious emotions like guilt, shame, or pride. Distinctions between basic and secondary emotions are mainly based on biological and evolutionary priorities as espoused by the differential emotions theory (DET; Izard, 1984; Tomkins, 1987). Basic emotions seem to appear earlier, in the period of 6 to 8 months of human development. Their functional purpose is to address threats and opportunities in relation to survival needs and is useful for coordinating behavioural, attentional, cognitive, and physiological responses (Kim, Thibodeau, & Jorgensen, 2011). In addition, basic emotions are not dependant on development of cognitive abilities but they may contain cognitive elements as and when cognitive abilities develop. On the other hand, secondary emotions or self-conscious emotions appear later in development in conjunction with cognitive abilities as they involve the development of a distinct self versus others and self-evaluative processes. Self-evaluative processes often involve the ability to divert attention to the self for the purpose of self-reflection, understanding the self as an agent of behaviour, and attributing discrepancies between internal standards imposed by the self and the self's behaviour. Self-conscious emotions require more sophisticated and complex cognitive skills as their function is related to social and interpersonal survival and is crucial for evolutionary success (e.g. status maintenance, group acceptance, complex social structure negotiations).

Many models of emotion have been derived from the basic emotions model where it is thought that each discrete emotion has specific eliciting conditions accompanied by specific physiological, expressive, and behavioural patterns of reaction (Tomkins, 1964, Ekman, 1994, Izard, 1971, Levenson et al., 1992). These emotion theorists have particularly emphasized the early patterning of discrete emotions (Izard, 1994; Izard et al., 1980, 1995), the discrete prototypical facial expressions, and the cultural universality of these patterns (Ekman, 1972, 1994; Ekman et al., 1987; Izard, 1971, 1990; Levenson et al., 1992). These basic emotion models later came to be known as discrete emotion theories. As discrete emotion theories started developing, many other aspects of emotions came into focus. For example, emotion lexicon was considered a basis for building an emotion model where the underlying structure of an emotion could be understood and common cultural interpretation patterns could be abstracted. These were called lexical emotion models (Oatley & Johnson-Laird, 1987; Ortony, Clore, & Collins, 1988). Further, social constructivist models claimed that the meaning of emotions is usually determined from sociocultural behaviour and value patterns (Averil, 1980; Harre, 1986; Shweder, 1993). Cognitive and judgment aspects also came to be considered as components of emotion through appraisal theories (Lazarus, 1968, 1991). The appraisal theory of emotion postulated by Lazarus (1991) was based on fundamental themes of appraisal for basic emotions and resembled some of the fundamental assumptions of the discrete emotion theories (Scherer, 2000). According to appraisal theories, emotions are elicited through evaluations of events in relation to an individual's goals. The appraisal theories have been expanded in different ways by several appraisal theorists but overall, they tend to agree that specific physiological, expressive, and motivational changes are a result of appraisals unlike the earlier discrete emotion models where discrete emotions have considerably fixed neuropsychological circuits (Scherer, 2000). In conclusion, the different discrete emotion theories described here focus on different emotion components.

Discrete emotions are increasingly being investigated as independent variables that influence outcomes. Substantial evidence has accumulated suggesting that discrete emotions

have unique effects on cognition, physiology, behaviour, and experience. The functional aspect of discrete emotions refers to emotions as the evolutionary adaptive response that organizes these unique effects/components as a reaction to changes in the environment. The elicitation of discrete emotions influences cognition (e.g., narrowing or widening of attention), judgment (e.g., risk or opportunity perceived in the environment), experience (e.g., the awareness of a characteristic of an emotion), behaviour (e.g., a tendency to take a particular action or a particular reaction), and physiology (e.g., changes in heart rate or respiration, changes in the brain or biochemical changes as in hormones) in varying degrees and each emotion either produces changes in all these systems or a subset of these systems (Lench, Flores, & Bench, 2011). When these multiple components are efficiently coordinated, then they produce goal-effective behavioural responses that result in flexible adaptation. Most emotion theories (above) propose that changes occur in most components, but each theory emphasizes different components. Experimental manipulations have predominantly been used to investigate emotion theories but these have often resulted in divergent views of the importance of each emotion component. The divergent views have mainly been mired in disagreements over the way emotions are elicited in experimental manipulations, which in turn may have had effects on determining differences between the different models or theories of discrete emotions. Evidence for the discrete emotion models has been found in a meta-analysis that was conducted to determine the effect of discrete emotions on cognition, behaviour, physiology, and experience through experimental emotion elicitations (Lench, Flores, & Bench, 2011).

The findings from the meta-analysis demonstrated that the experience of emotions occurred following the various modes of elicitation (e.g. films, pictures etc.) and that significant differences between components were observed between pairs of emotions (for e.g. sadness and anger). The meta-analysis study also confirmed focal differences between discrete emotion models. For example, behaviour, experience, and physiology covaried more strongly following the elicitation of different emotions, specifically in happiness, sadness, anger, and anxiety while cognition and judgment did not correlate with changes in other components. Furthermore, it

was found that cognition and judgment were uncorrelated with one another suggesting their independent focus in discrete emotion models. Findings from the meta-analysis provides some evidence for the discrete emotion models (outlined above) as theories that either emphasize experience, physiology, and behaviour or those that emphasize cognition and judgment. Discrete emotion theories based on patterns of neurophysiological circuits emphasize the correlation between behaviour, experience, and physiology while appraisal theories emphasize cognition and judgment. Another important finding was in regard to the experimental method used in the studies analysed. The experimental emotion elicitation method provided evidence in support of experience, physiology, and behaviour components but did not seem to support the priming of cognition and judgment. Although there may be individual and situational factors involved in moderating the emotional elicitation effects on cognition and judgment, it is also possible that the experimental manipulation design may be less suitable in drawing out the complexities (e.g. motivations, valence, and expression) involved in cognition and judgment. On the other hand, research in appraisal theories has shown that implicit evaluations or appraisals of a situation can also influence the elicitation of emotions in a rapid and automatic fashion as much as perception can elicit emotions (Moors, 2006). Clore and Ortony (2009) claim that cognitive appraisals can become mindless and automatic due to previously learned associations. People can be unaware of cognitive cues that have previously been conditioned into neural networks and react in the same way in situations that have been previously experienced. Additionally, according to the emotion generation process of Gross (1998), cognitive reappraisals of the situation can occur prior to the elicitation of an emotion and this can also influence appraisals and judgment in experimental studies.

2.1.1.1 Discrete Emotion Components

Emotions are known to have multi-componential characteristics such as affect, behaviour, action tendencies, appraisal, and physiology. (Clore & Palmer, 2009; Frijda, 1986; Scherer, 2005). Although the components are discussed separately below, it needs to be pointed out that these components usually occur in a synchronized fashion when an emotional

experience unfolds. In the following sections, key components will be outlined with specific emphasis on emotions that have been examined in this thesis. These emotions are: fear, hostility, sadness, shame, and joy.

Affect

Affect can be referred to as the hedonic tone that accompanies an emotional experience and each emotion can vary in the degree of affectivity, regardless of valence. An emotion can be an experience of pleasure or pain and this further influences action and behaviour. Pleasure is usually associated with approach whereas pain is associated with avoidance. Affect is a subtle feeling that can prompt an individual to pay attention to a stimulus and initiate emotional responses such as changes in physiology, behaviour, or cognitive responses (Frijda, 1988). According to Russell's (2003) circumplex, affect is a combination of pleasure/displeasure and activation/deactivation (can also be called arousal) and both aspects influence the experience of an emotion.

In the case of negative emotions, displeasure is often experienced but activation varies. For example, a feeling of displeasure or pain is felt for fear, hostility, sadness, and shame but the degree to which displeasure is activated are different for each emotion. Emotions like sadness or shame may be lower on activation while hostility may be higher on activation. Alternatively, fear could either be high or low in the activation domain depending upon the eliciting situation. If fear has been detected due to some external threat then it would lead to higher levels of activation but if fear is an underlying learned behaviour then fear could also be at the lower end of activation. Hostility is associated with displeasure and high activation (Heponiemi, Ravaja, Elovainio, & Keltikangas-Jarvinen, 2007).

Appraisal and Coping Patterns

Appraisal patterns form one of the most important parts of an emotional experience. The age old debate between emotion theorists on equating emotion with cognition has brought to light the important role of appraisal in emotional experience (Clore & Ortony, 2008).

Appraisals involve cognitive activity in the emotion process that provides information about the person-environment interaction (Lazarus, 1991). In 1960, Magda Arnold planted the seed that humans innately evaluate anything we encounter almost immediately and automatically in relation to personal significance (Clore & Ortony, 2008). The planted seed gave birth to the appraisal theories of emotion. Among the early appraisal theorists, Lazarus (1966) offered a theory of stress and coping in which appraisal takes place at two levels. Primary appraisal occurs when a threat is perceived to oneself and secondary appraisal is concerned with cognitive processing of possible response options towards the threat. When the appraisals are deemed as exceeding one's resources and capabilities, then the person is likely to perceive the situation as stressful. These appraisals often give rise to emotions that alerts an individual to the importance of a situation and in response, coping processes are triggered. Coping is the process of managing the perceived stress through cognitive and behavioural efforts (Lazarus & Folkman, 1984). A number of appraisal theories have since taken root with many variants of the different forms and theories of appraisal (Moors, Ellsworth, Scherer, & Frijda, 2013). A common thread that runs through the many appraisal theories is that "emotions are adaptive responses which reflect appraisal features of the environment that are significant for the organism's well-being" (Moors et al., 2013, p. 119).

The current debate among appraisal theorists is whether emotions have distinct expressions, thoughts, feelings, neurochemistry, and behaviour or whether a core affect system consisting of positive and negative reactions and arousal defines emotions. As per the core affect system, the situation determines the valence and the specific emotion elicited (Russell & Barrett, 1999). For example, in a situation involving threat, fear is elicited whereas in a situation involving a loss, sadness is elicited. According to Barrett (2006), discrete emotions are more loosely organized psychological states than tight modules of various components. This debate has fuelled further questions about the nature of appraisals and appraisal processes and these claims are still being debated among appraisal theorists. For the purposes of this thesis,

the view taken is that distinct appraisal patterns predict specific emotions as different emotions can be elicited even in the same situation (Siemer, Mauss, & Gross, 2007).

An appraisal can be defined as “a process that detects and assesses the significance of the environment for well-being” (Moors et al., 2013, p. 120). Appraisal theories have some commonalities and differences. The commonalities provide an overview of the role of appraisal in emotion while differences show that there are issues that have remained unresolved about the appraisal process. The issue of interest in this thesis in relation to appraisals is concerned with appraisals as a component of emotions and its influence in coping and emotion regulation processes. Each emotion can be considered a function of the way each individual appraises the situation and therefore appraisals act as the interface between the person and the situation, providing the flexibility to respond accordingly (Moors et al., 2013). In general, each individual discrete emotion has similar appraisals while the difference between discrete emotions can be attributed to different appraisals (Lazarus, 1991). Therefore, to understand how discrete emotions are regulated or regulates, it is also crucial to understand the role of appraisals in emotions and current issues that have been unresolved. Accordingly, some commonalities or core features of appraisals are discussed below followed by some differences among the theories.

Commonalities and Differences in Appraisals

Appraisals can be conscious or unconscious and eventually shapes the ensuing emotional experience that unfolds sequentially over time (Grandjean, Sander, & Scherer, 2008). According to appraisal theorists, the different emotion components are derived from the appraisal of the environment and the person-environment interaction (Lazarus, 1991; Moors et al., 2013). Moreover, emotion components are likely to change as per changes in the appraisal. Unlike other discrete emotion theories, appraisal theories consider appraisals as the centre of emotional components that influences the elicitation and subsequent intensity of other components such as action tendencies, behaviour, physiology, and feelings (Clore & Ortony, 2000; Frijda, 2007; Lazarus, 1991; Reisenzein, 1994; Roseman & Smith, 2001; Scherer, 2001).

Further, appraisals are also considered as the core component of feelings. Feelings are a representation of the conscious reflection of changes in other emotional components (Lambie & Marcel, 2002). As feelings unfold, a part of the unconscious appraisals or the appraisal output can become conscious and can shape motivational, somatic, and motor components (Moor et al., 2013). Additionally, appraisals can vary and multiply in number. If only a few appraisals are made, then the emotional experience is likely to be less differentiated and more global. But if the number of appraisals increases, then it is likely that the emotional experience is highly differentiated and specific (Moor et al., 2013). Appraisals also determine how people vary in their response to the same situation. According to the appraisal theories, although the relation between appraisals and emotions can be variable, the relation between appraisals and emotions remain stable. In other words, people's perceptions of an event can differ and therefore the appraisals lead to different emotions but similar appraisals made by different people can lead to the same emotion.

Although differences in appraisal theories remain unresolved, these issues can also be seen as issues of the appraisal processes as a whole. An important aspect of appraisals that has remained unresolved is the extent to which appraisals are central to emotions in as much as the extent to which other components are represented in emotions. Additionally, issues surrounding the extent to which each component contribute to the quality of feelings and whether each component maintains a certain amount of granularity in feeling states have also been unresolved. Appraisals form an important part of the unfolding of an emotional experience as they provide necessary information for coping or regulation. According to Lambie and Marcel (2002), the unresolved issues depend on attentional variables that form a part of emotional experience. The experience of an emotion commences in response to an event that triggers primary appraisal and physiological or physical changes simultaneously, followed by secondary appraisal consisting of either reappraisal or coping which are dependent upon an awareness of emotional phenomena (Lambie & Marcel, 2002). The extent to which individuals are aware of emotional phenomena depends upon individual differences in attentional deployment and these

are different over the course of an emotional experience and between emotion experience occasions. The issue of emotional awareness contributes to ambiguity between emotional states and emotion regulation. Different degrees of awareness is likely to influence the degree to which people will perceive or experience higher levels of granularity in emotions and the extent to which people will be detached or immersed in the object of attention (i.e. components of an emotion) (Lambie & Marcel, 2002). Essentially, even though appraisals are thought to precede the experience of an emotion, the extent to which an individual is emotionally aware is important for perceiving emotional components. Based on this description of emotional awareness and the current knowledge of appraisals, it can be said that both emotional awareness and appraisals are interdependent and this is likely to further influence coping and emotion regulation. An expanded discussion of the emotional awareness construct is continued in the emotion regulation section as it forms a part of the ER construct being explored in this thesis.

Appraisal Patterns and Coping in Discrete Emotions

According to Lazarus (1991), people usually experience a whole variety of emotions in a lifetime but their experience depends upon the ability to verbalize, distinguish, recognize, or label them. Based on research findings, Lazarus (1991) proposed an approach to appraisal patterns for discrete emotions that consist of primary and secondary appraisal. Primary appraisal components consist of goal relevance, goal congruence, and type of ego-involvement and secondary appraisals may involve blame or credit, coping potential and future expectations. Put together, primary and secondary appraisals create a diverse range of cognitive patterns which give rise to descriptions of relational meanings for each emotion and differences between them. A brief appraisal pattern and coping tendency for each emotion is provided below.

Hostile appraisal patterns are highly related to those of anger. Those who are hostile often appraise the situation from a negative bias of beliefs about others in general (i.e. cynicism) and a belief that others are not to be trusted and therefore are to be blamed (Barefoot, 1992). The appraisal pattern for hostility is more related to secondary appraisal in anger where others are held accountable and therefore to be blamed. Because of the negative beliefs held and the

non-trusting attitude, a hostile individual is mostly likely to remain in a psychological cycle of hostile cognitions unless the individual becomes capable of reappraising to counter their held beliefs.

Fear can be conscious or unconscious (Ohman & Mineka, 2003). The primary function of fear is to respond to an external threat. Appraisal patterns for fear fall within the fright-anxiety continuum. The primary appraisal pattern for fear is more concerned with goal incongruence where there may be an external threat to well-being in the form of bodily harm and the secondary appraisal involves uncertainty in coping and future expectancy. Primary appraisals for anxiety involve existential threats to a valued role or goal while secondary appraisals involve uncertain coping and an uncertain future expectancy.

In sadness, the appraisal patterns involve an irrevocable loss where a sense of helplessness about restoring the loss is felt (Lazarus, 1991). A loss can be of diverse kinds such as a loss of a valued role or (life) goal or the failure in achieving a goal, self-esteem or social status, or a moral value (Izard, 1991; Oatley & Johnson-Laird, 1987; Lazarus, 1991; Power & Dalgleish, 2008). Sadness can be temporary (temporary separation from a loved one) or permanent (e.g. death of a loved one). In contrast with other emotions (e.g. anger, fear), sadness can be experienced for a short period of time and can extend to longer periods of time as in years. The sadness and depression continuum can be distinguished through length of time, between feelings of helplessness and hopelessness, and future implications. Depression can also be viewed as a reaction to loss but it often lasts longer and is experienced as a sense of hopelessness that extends to implications for the whole life (Lazarus, 1991). Coping in sadness often occurs through resignation rather than a struggle and involves disengagement.

Guilt and shame are overlapping emotions that involve internalized thoughts and actions that defy social norms and values (Lazarus, 1991). The difference between guilt and shame lies in how thoughts and actions are internalized. In guilt, the internalized thoughts and actions refer to norms and values that are expectations by parents and/or society. In shame, the internalized thoughts and actions are about one's ego-identity where discrepancies may arise

from what a person is and what he/she wants to be. The primary appraisal in shame involves the failure to live according to an ego-ideal and the secondary appraisal is concerned with blaming oneself for the failure. Shame-prone individuals usually cope by redoubling their efforts towards achieving an ideal. According to H. Lewis (1971), people who experience shame have internalized the feeling of shame as a failure to abide by parental standards and the assumed punishment for this is the underlying threat of rejection and/or abandonment.

According to Lazarus et al., (1980), pleasant emotions represent an active striving for mastery and gain. Joy is the only positive emotion that has been selected for this study as positive emotions have been shown to be less differentiated. Joy is a pleasant feeling that is experienced as a reward for success when a valuable goal has been achieved or progress towards a value has been made (Lazarus, 1991). Joy is also experienced when people are happy, delighted, excited, or even when they are feeling alive or lively. In this respect, pleasant emotions are less differentiated than unpleasant or negative emotions and therefore their appraisals have also been found to be highly intercorrelated (Ellsworth & Smith, 1988). In particular, joy and happiness have often been examined as substitutes as they appear to be generic, undifferentiated responses to pleasant situations (Weiner, 1985). An appraisal of a situation as pleasant is not likely when the situation appears to be uncertain.

Action Tendencies and Behaviour

Action tendencies can be referred to as patterns of preparedness of expressive behaviour in response to an emotion eliciting event (Frijda, 1988, 1999). An action tendency may or may not result in the expression of the behaviour. Action tendencies are also considered biological urges such as impulses and may differ within the same emotion according to the meaning derived from the situation (Lazarus, 1991). For example, the action tendency of aggression may be verbal or physical depending upon the eliciting situation.

Action tendencies vary considerably with regard to individual emotions. In fear, the action tendency is to avoid or escape or the impulse to get away from an imminent threat. The

tendency of wanting to avoid or flee from a potential harm is different from anxiety as there is an obvious threat to the person's well-being. In anxiety, there is no concrete goal to facilitate the behaviour of avoiding or fleeing because there is nothing specific to get away from (Lazarus, 1991). The action tendency for hostility includes the capacity for verbal and physical aggression which may or may not eventuate as expressed behaviour (Heponiemi, Ravaja, Elovainio, & Keltikangas-Jarvinen, 2007). The action tendency for shame is to avoid and hide from public exposure or rejection in order to preserve one's social status or one's self-esteem (Folkman, Lazarus, Dunke;-Schetter, et al., 1986). In sadness, the action tendency is obscured in inaction where withdrawal from the environment and focus on oneself leads to an immobilized state that can be viewed as expressed behaviour (Lazarus, 1991).

Action tendencies of positive emotions such as joy are generally non-specific. Based on Fredrickson's broaden-and-build theory of positive emotions, discrete positive emotions do not necessarily have prototypical action tendencies when compared to negative emotions. In fact, positive emotions allow for "free activation" as cited by Frijda (1986, p. 89).. Positive emotions are associated with thought-action tendencies that are broader and possibly novel. This allows the individual to pursue thoughts and actions in free and unscripted forms. Rather than having a specific function, joy broadens the capacity for readiness to interact with the environment in free form.

Physiology

Discrete emotions have distinct physiological patterns that are regulated by the brain. Emotions recruit the autonomic nervous system (ANS) in preparation for a physiological response (e.g. fighting, fleeing, freezing, bonding) to diverse situations (Levenson, 2003). For example, the experience of fear prompts a person to get ready for an action that could involve the urge to flee and corresponds with distinct ANS activity patterns. The ANS activates other relevant motor systems which results in a behavioural response for that particular situation. The ANS activity is thought to be the underlying system for diverse action tendencies when discrete emotions are experienced (Frijda, 1999). From another perspective however, physiological

responses for specific emotions cannot be cleanly distinguished because they emanate from a single nervous system, the ANS. Moreover, the activation of physiological responses can occur within the range of autonomic and conscious responses.

According to discrete emotion theorists, distinctive patterns of ANS activity are associated with a range of discrete emotions. Findings from studies have revealed different patterns of autonomic responses in the form of elevated heart rate, rises in body temperature, or tension in particular body parts for specific emotions such as fear, anger, sadness, happiness, and disgust (Ekman, Levenson, & Friesen, 1983; Levenson, Cartensen, Friesen, & Ekman, 1991; Levenson, Ekman, & Friesen, 1990). Further, a meta-analytic study also provided evidence for emotion-specific autonomic patterning but the findings appeared to be weak (Cacioppo et al., 1997; Cacioppo et al., 2000). The weak findings can be attributed to inefficient methods employed in these studies. Specifically, when research evidence from individual studies is compared, the intensity of physiological responses for each specific emotion does not correspond with each other and physiological responses for individual emotions do not necessarily activate the same motor systems.

Physiological correlates of negative emotions such as anger, fear, and sadness were examined in more detail in other studies. For anger and aggression, typical physiological responses included sympathetic activation where increases in cardiac output occurred along with the constriction of blood vessels and increases in blood flow to the skeletal muscles and brain (Folkow, 1993). Similar sympathetic activation occurred when fear was experienced with the exception that the physiological responses prepared the individual for responding to an external threat. Also, changes in facial expression were an obvious difference between anger and fear. In the case of sadness, physiological distinctions in comparison to other emotions have consistently been absent but elevated heart rate and skin conductance has been observed in comparison to a baseline (Levenson et al., 1990; Levenson et al., 1992).

Of the positive emotions identified in the literature, happiness has been the most examined positive emotion due to its status as a basic emotion and its broader scope in

representing many quality domains of life (Power & Dalgeish, 2008). The positive emotion joy examined in this thesis is often used interchangeably with happiness (Lazarus, 1991). In this respect, research identifying physiological correlates of happiness provides some insight about the physiological responses of joy also. Physiological responses of positive emotions are also less differentiated than negative emotions. Facial expressions of positive emotions are hard to distinguish as they share the Duchene smile and likewise evidence for specific physiological responses has often been difficult to distinguish.

Research on discrete emotions and corresponding physiological responses is presently an active area of study and it seems that more refined computer-aided models for recognizing specific emotions are beginning to be used. More sophisticated computer-aided technological advances have made it possible to collect data in real time by specifying emotions through a computer program simulation involved in the simultaneous tracking of micro facial expressions, cardio activity, skin conductance, and somatic activity. This will likely provide confirmation of specific physiological correlates for each emotion in the future.

2.1.1.2 Discrete Emotions Versus Mood and Affect

Emotion states can also be differentiated from moods and affect. In the following sections, differences between emotions and moods and emotions and affect are discussed consecutively. The main purpose is to draw out what is meant by emotion states in comparison to other emotion-related phenomenon. It is imperative that an independent conception of emotion states is established so that the communication of the differences between emotions and its regulation also remain clear throughout the thesis.

Emotions and Moods

Emotions have been described as feeling states (Izard, 2009) and mental states (Ortony, Clore, & Collins, 1988). As feeling states, emotions can be triggered either by internal or external states and can be activated by cognitive and noncognitive processes (Izard, 1993; Ledoux, 1996). As mental states, emotions are elicited by the external environment and can

have phases of intensity that can be measured behaviourally, physiologically, or by self-report (Plutchik & Kellerman, 1989). Behavioural and physiological measures have been useful in identifying the duration of emotions but these measures have not been consistent with self-reports of emotions. Some theorists argue that these inconsistencies can be attributed to differences between emotions and moods. Emotions and moods have often been distinguished based on a set of criteria consisting of underlying physiological processes and behavioural responses but these distinctions have not been supported by published data (Schimmack & Siemer, 1998, Unpublished Manuscript as cited in Beedie, Terry & Lane, 2005). But nevertheless, some important criteria used for distinguishing emotions and moods are based on the following: (1) specific events that lead up to the elicitation of emotions whereas moods are more general and less involved with specific objects or elicitors (2) the provocation of specific physiological patterns when specific emotions are elicited while physiological patterns in moods can be more global or not even be present (3) the intensity in emotions is greater than in moods while moods are more diffuse and global affective experiences (4) emotions tend to be fleeting and shorter in duration while moods tend to be more enduring and stable over time (Beedie, Terry, & Lane, 2005).

Most emotion theorists agree that the function of emotions is to draw the attention of a person to the importance of an event and using the corresponding information and appraisals (perceptions and cognitions) to adapt to the concurrent event (Barrett & Salovey, 2002; Cole, Martin, & Dennis, 2004; Frijda, 1996; Izard, 2009; Lazarus, 1991). Emotions prompt us into a mode of action readiness. For example, fear makes us ready to take an action that involves flight or fight. Accordingly, one of the main functions of emotions is to reprioritize goals in the wake of internal changes or according to changes in the environment. Moods on the other hand maintain continuity in action readiness as in irritability for example, where there is a predisposition to react with anger or hostility. In this respect, it has also been argued that emotion biases behaviour while mood biases cognition (Davidson, 1994). Further, even though moods are generally known to be more long lasting than emotions, emotions can also last for

longer periods of time without turning into a mood (Lambie & Marcel, 2002). For example, jealousy can last for days or years and can manifest in behaviour continuously. Another example is that of love or lust that can last for a longer duration of time and do not count as dispositions according to most criteria.

Emotion theorists agree that emotions and moods share similar characteristics but they are also distinct phenomena. The difference between emotion states and mood states are mainly quantitative rather than qualitative and therefore a rigid distinction is not possible. But nevertheless, the focus on emotions in this thesis is primarily based on the view that emotions are brief and intense affective experiences that may or may not have been developed in the early years of life.

Emotions and Affect

Emotions are a subtype of a higher order category of valence states (i.e. positive or negative) called affect and are usually experienced when an organism encounters meaningful stimuli that require adaptation (Scherer, 1984). Affect is either a positive or negative feeling in response to stress, emotions and moods, or other motivation impulses (Gross & Thompson, 2007). In addition, affect has also been referred to as affective style and emotionality. The term “affect” or “affective” will generally refer to this higher order category in this thesis.

Theories of emotion have several categories and affect belongs to the dimensional approaches category where two broad underlying structures, in particular valence and arousal, make up the structure. Valence can be referred to as hedonic tone comprising of pleasantness and unpleasantness while arousal can be referred to as activation/deactivation or as actions or types of energies that describes the two ends of the continuum (Barrett, 1998; Russell & Barrett, 1999; Watson, Clark, & Tellegen, 1988). The dimensional approach has mainly been drawn from self-reports of feelings where participants were instructed to describe how they experienced emotions based on how true they found the adjectives applied to them. After conducting a factor analysis, two clusters have generally emerged that represented valence and

arousal (Russell, 1980; Russell & Barrett, 1999) and positive and negative affect (Watson & Clark, 1994; Watson & Tellegen, 1985). More recently, emotion theorists have organized the approaches to emotion into levels where valence and activation belong to the higher level followed by the affective approaches and then the discrete emotions. The bulk of research that has examined dimensional approaches has mainly used the affective approach for investigations in studies and therefore comparisons between dimensional approaches and discrete emotions can only be used from the affective approach research.

The affective-based dimensional approach has mainly been measured by Positive and Negative Affective Schedule (PANAS; Watson & Clark, 1994). The development of the PANAS has been proposed as a hierarchical taxonomic scheme in which the higher levels represent two broad dimensions and the lower level is composed of distinguishable emotional states (Watson & Tellegen, 1985, Tellegen, Watson, & Clark, 1999). An analysis of the hierarchical structure conducted by Tellegen et al., (1999) supported the three hierarchical levels namely, the general Happiness versus Unhappiness dimension, the positive affect and negative affect dimensions at the next level, and the discrete emotional states at the base level. The researchers suggested that the use of the PANAS at different levels could provide meaningful comparisons between more global higher level affective experiences and lower level emotional states. For example, the heuristic value of each level in the hierarchical structure allows researchers to determine more differentiated perspectives in relation to other psychological constructs. This aspect of the PANAS is in direct contrast to other measures of emotions that measure only one emotion or that measure only the valence, arousal, physiology, approach-avoidance, or behavioural (e.g. facial and vocal) aspects of emotions.

Positive and Negative affect has consistently and reliably emerged as two dominant variables at the second higher level (Watson & Clark, 1994). Additionally, the tripartite model of Clark and Watson (1991) have also found that positive and negative affect account for the majority of variance at the higher valence dimensional level. Moreover, positive and negative can be said to be independent constructs as opposed to being on a continuum (Watson & Clark,

1994). Those who experience higher levels of negative affect often report unpleasantness or upsetting feelings while those who experience low negative affect are usually more calm and relaxed (Watson & Tellegen, 1985). Likewise, those who experience positive affect can be described as experiencing “a zest for life” with increased feelings of energy, interest, and alertness and those who experience low positive affect usually reporting feelings of drowsiness, sleepiness, and sluggishness (Watson & Tellegen, 1985). Furthermore, research evidence has shown that the tripartite model provides a link between affect and psychopathology and also provides an explanation for both the comorbidity and differences between mood and anxiety disorders (Clark & Watson, 1991; Clark et al., 1994; De Bolle, De Clercq, Decuyper, & De Fruyt, 2011). Psychiatric patients generally report higher levels of negative affect than non-patients (Watson & Clark, 1994). Trait-like negative and positive emotionality have also been shown to be strong predictors of psychological functioning and psychopathology (Watson, Gamez, & Simms, 2005; Watson, Kotov, & Gamez, 2006). Negative emotionality, also referred to as neuroticism and behavioural inhibition, can be said to exist on a continuum as they are highly conceptually related and similarly positive emotionality or extraversion and behavioural activation are also on a continuum (Watson et al., 2005).

Both negative and positive emotions play their own part in contributing to human survival and well-being. According to cross-cultural anthropological accounts, emotions are elicited when evaluations in relation to important goals and needs are to be revised. In this regard, negative emotions are experienced when universal goal-based problems in one’s social life are encountered and positive emotions are experienced when these situations are resolved (Lutz, 1988). Positive and negative affective dimensions have been well researched and evidence for its links with psychopathology is well established but evidence for the complexity of specific emotions is increasingly gaining attention. Although positive and negative affect has contributed considerably to our understanding of emotional disorders in psychopathology, the pathways in which affect exerts its influence in emotional disorders is still less clear. The countless studies of negative affect has mainly focused on the influence of negative affect but

have not considered other possible mediating variables or other independent influences in the relationship between negative affect and psychopathology. It is clear that affect acts as a global emotional indicator of patterns of comorbidity among anxiety and depressive symptoms but they do not fully account for the overlap between the syndromes. It is likely that individual discrete emotions may have distinct effects that cannot be reduced to the function of their valence. For example, anger and sadness have different effects on physiology and behaviour even though they are both negatively valenced.

The affective-based dimensional approach can be compared with discrete emotion models based on what they are actually measuring. Positive and negative affect as measured by the PANAS at the higher level (Watson & Tellegen, 1988) measures global mood states while at the lower base levels, distinct emotional states are being measured. Even though the PANAS captures two broad dimensions at the higher level, research has shown that individuals are highly capable of distinguishing between discrete emotions at the lower levels (Tellegen et al., 1999). Furthermore, the higher level dimensions emphasizes the measurement of valence and arousal while at the lower level key components of emotions, such as physiology, behaviour/action tendencies, and appraisals are emphasized.

Basic characteristic differences between affect and discrete emotions also offer an understanding of how they can have distinct effects on mental health and well-being. Affect can be referred to as conscious or unconscious automatic responses that provide a quick feeling of whether something is good or bad or whether something is liked or disliked. An emotion is a single longer lasting state of conscious feeling that is characterized by changes in arousal. Affect is mainly differentiated based on valence, i.e. positivity versus negativity, while there is a large assortment of emotions and moods that people experience (Roseman, 2001). Affect lacks the complexity, the range, intensity, and variety of specific emotions because they are mostly rapid responses to a situation that may also dissipate as quickly as they are experienced. Emotions in this respect are slower to surface and dissipate. Moreover, some discrete emotions, such as fear, sadness, and anger, are hard-wired, have distinct behavioural and physiological

characteristics, and are primarily concerned with survival-critical functions (Levenson, 2011). Affect may not entail elaborate cognitive processing but the information contained in affect (i.e. positive or negative) may influence subsequent cognitions and behaviour. Emotions, on the other hand, are heavily involved with more detailed cognitions, especially evaluations (Roseman & Kaiser, 2001).

The distinction between the dimensional approach and discrete emotions approach can also be gauged from how emotion affects behaviour. Izard and Ackerman (2000) have noted that the relation between emotion and behaviour develop early in life and tend to remain stable over time. As a child grows, new behaviours add on to the repertoire for a specific emotion in line with the existing ones while retaining a similar function. The ongoing stable relationship between emotion and behaviour has further been explored from a large body of empirical findings by Baumeister and colleagues. Baumeister et al., (2007) proposed that in addition to the direct effects of emotion on behaviour (e.g. fear leads to flight, anger leads to fight), emotion is more likely to influence behaviour indirectly through feedback loops. The theory proposed takes into account differences between affect and emotions as well as their coordinated and interrelated influences. The speed and automaticity of affect can influence behaviour at a moment's notice while emotions take time to stir up cognitive processing and physiological changes in order to influence behaviour. In certain circumstances, human survival depends upon the ability to respond quickly to a situation. When a situation is immediately appraised as bad or when confronted with a snake for example, then affect provides the ability for an immediate response to run. In this respect, the evoked emotion, i.e. fear in this snake example, usually remains in the memory and is considered more long lasting and therefore often leaves an affective residue in association with the behavioural outcome. This often influences future action/behaviour. Before a similar behaviour is about to occur in another instance, the course of action is deliberated based on the memory of the previous behavioural outcome associated with the affective residue. So before deciding to go for a walk in the bush, the last incident of spotting a snake is considered and a decision is made according to the affective residue. As

such, affect can influence or preserve the information from previous emotional experiences and this can form a feedback loop where future action is chosen based on the anticipated emotion. For example, people make choices or changes in their behaviour with an intention to avoid guilt or regret. According to Baumeister et al. (2007), affect provides a signal as to whether rules pertaining to the choice of action needs to be revised before future action is taken while a specific emotion may trigger ruminating thoughts about whether a different action would have led to a different outcome. The experience of positive emotions generally provide a confirmation that the successful use of the particular rule has been effective and therefore a positive affective residue will presumably result in the future application of the same rule and similar behaviour. Negative emotions signal that the rule needs to be revised as a result of a previous unsuccessful behaviour. When the same old rule is about to be applied, then the negative affective residue provides a warning so that a similar mistake can be prevented. This account of the emotion feedback loop provides one side of the picture as it seems to assume that people will generally approach a situation and learn from emotional cues. However, another variable in the feedback loop that needs to be considered is emotion regulation.

2.1.1.3 The link between emotions and emotion regulation

The emotion feedback system generally occurs in an ideal scenario where it is assumed that people will learn from the emotion feedback loop. In an ideal situation, the anticipation of an emotional outcome that is derived from feedback helps guide decision-making that is optimal and beneficial and this feedback system also provides the opportunity to learn a lesson in the form of an affective cue that guides future action or behaviour. But not all situations are ideal because there are many other factors involved that can make learning go awry. Learning is not facilitated when feedback is not taken into account in decisions for future action. The difference between adaptive and maladaptive learning provides an indication of when the emotion feedback system can become ineffective. Adaptive learning is promoted when an individual is conscious about the emotion. The state of emotion consciousness facilitates learning through memory, by automatically activating affect, and through the anticipation of an emotional

outcome. Learning becomes maladaptive when the desire to avoid or escape emotional distress produces a short-term focus whereby a pressing need is felt to feel better immediately. The desire to avoid or escape prevents the processing of emotions including the suppression of any feedback that usually arises from processing. In this way, a short term gain is usually linked to more harmful and delayed costs to the individual as this can result in a self-defeating behavioural trap. An example of short term benefits that outweigh long term costs can be observed in the use alcohol.

Research suggests that one of the main explanations for the excessive consumption of alcohol is to escape from acute emotional distress. Usually, the short term intent is to get rid of bad feelings and emotions at the expense of long term benefits such as experiencing the emotion with full consciousness. When this kind of learning enters the emotional feedback system, then the choice to consume alcohol takes over as the intent is to reduce emotional distress in the short term at the expense of being fully aware of lessons to be learned in the long term. Another intention for choosing alcohol could also be to enhance good feelings. This anticipation of an emotional outcome could also become a problem because when the behaviour (i.e. alcohol consumption) does not lead to the intended consequence (i.e. good feelings) then it can become a trap whereby the person can become increasingly insensitive to other behaviour-shaping consequences and the maladaptive behaviour is likely to continue. This is only one example of how maladaptive learning can influence behaviour but many such examples can be seen in other behaviourally-related psychological disorders such as eating disorders, anxiety disorders, and depression.

Research is increasingly showing that when people are unwilling to tolerate unpleasant emotional states, an effort to control, alter, or escape from them becomes the primary goal. In order to change their emotional state, people are likely to engage in a variety of strategies to alleviate emotional distress. According to Baumeister et al., (2007), when behaviour is aimed at promoting changes in emotional states, then the behavioural consequences are derived from emotion regulation instead of the emotion itself. In other words, an emotion or an anticipated

emotion can indirectly influence behaviour through emotion regulation. The kind of strategy used, whether conscious or unconscious can lead to adaptive or maladaptive behavioural consequences. At present however, it is not clear whether all specific emotions of the same valence influence its regulation or whether learned emotion regulation strategies influence the elicitation of an emotion. The temporal relationship between specific emotions and emotion regulation are still unclear. Moreover, distinctions between specific emotions, specifically their different functions, suggest that each emotion may be regulated differently. Further, the variety of emotion regulation strategies and their adaptive and maladaptive effects also have the potential to play a role in the way an emotion is regulated.

At present, there is a paucity of studies where specific emotions and ER have been examined (these studies are discussed in more detail in chapter 4) but research has shown that the ability to identify and differentiate among specific emotions can contribute to more effective coping and emotion regulation (Feldman Barrett, Gross, Christensen, & Benvenuto, 2001). Most studies have either used dimensional model measures (i.e. positive and negative affect) or psychological symptom measures (e.g. measures of depression or anxiety) in conjunction with ER measures to investigate their combined effects on outcomes or to understand the role of emotions and ER in psychopathology. One reason why specific emotions might have been ignored in research with ER could possibly be due to the focus of investigation in these studies and the limited availability of time and resources for conducting more elaborate research. The use of dimensional measures to assess emotions in conjunction with ER were possibly due to its ease of administration and corresponding ease in statistical analyses. Moreover, positive affect and negative affect, as measured by the widely used PANAS because of its notable psychometric properties, have been shown to be independent constructs that reliably measure emotions and moods in everyday life and have therefore been considered adequate measures of emotions (Egloff, 1998). Additionally, both positive and negative affect have been shown to maintain its relative independence and psychometric properties across time frames and research methodologies (e.g. experimental designs, surveys, or ecological momentary assessments).

Because positive and negative affect have been demonstrated as robust measures of global moods and emotions, it is possible that this has also influenced the focus of research investigations in the majority of studies.

From another perspective, the use of dimensional measures and psychological symptom measures may possibly be due to a reason that is more theoretical in nature as this is concerned with whether emotions and ER are different facets of a single process or are two separate factors. It seems that research investigations have not considered this the theoretical notion that emotions and ER either belong to a single dynamic emotional process or are two separate factors. Therefore it might have been justified to examine ER constructs on their own (without emotions or affect) to determine its role in psychopathology. The debate on this topic is ongoing but a short review of both sides of the debate is presented below.

Emotion and Emotion Regulation as a one factor model or two-factor model?

An understanding of whether emotions and ER is a one-factor model or a two factor model has implications on how studies are designed and interpreted. Some researchers propose that emotions and ER are conceptually separable and therefore methodologically they should be studied as two separate factors (Cole, Martin, & Dennis, 2004; Gross & Barrett, 2011; Thompson, 2011). Other researchers, however, claim that emotions and ER are a one-factor model or a single process (Campos, Frankel, & Camras, 2004; Kappas, 2011). Both sides of the argument are relevant in this thesis because there is still no clear consensus as to whether emotional experiences trigger ER or whether learned patterns of responding trigger emotions or the desired emotional experiences.

Researchers who have proposed the two-factor model suggest a clear distinction between ER and emotions (e.g. Cole et al., 2004; Gross & Barrett, 2011; Thompson, 2011). In contrast other researchers argue for a one-factor model (Campos, Frankel, & Camras, 2004; Kappas, 2011; Hollenstein, 2015). According to Campos and colleagues, any distinction

between ER and emotions is analytical and conceptual at best and mainly serves research purposes. Campos and colleagues argue that emotions are regulated as well as regulating and claim that emotions are seldom left unregulated. Emotions can be regulating when an emotion drives the goal or purpose of its regulation and automatically influences perception and behaviour or in other words the response to the emotion. For example, the emotion shame can be regulating and regulated as an individual would most likely want to avoid a situation where shame could be involved (regulating) and as a result that experience of shame is not felt (regulated). Another way in which the idea can be expressed is by viewing emotions as a continuous emotional process where conscious or unconscious decisions are made as to whether an emotional state is experienced. The single-factor model also lends further credence to the value in distinguishing between specific emotions as each emotion is likely to regulate and be regulated differently according to their specific function. It is also argued that selecting among emotions is itself self-regulatory as responses are being considered or auto-regulated because the emotional reaction itself implies that there is a bias towards the emotion-eliciting situation and prompts the individual to take immediate action (Kappas, 2011). Therefore, ER and emotions represent different facets of a single process (Campos et al., 2004; Kappas, 2011). Some reasons cited for the single process is based on the emotion generation process where (1) cortical regions can become activated before an emotion is generated, (2) previous regulatory patterns can influence subsequent choice of emotional experience, (3) the choice of an environment can also influence emotions, and (4) more than one emotion can be elicited through a single stimulus (Campos et al., 2004). Furthermore, research has also shown that ER-related or self-regulatory abilities are likely to develop earlier than cognitive meta-emotion capacities in early childhood. According to the one-factor model, ER processes essentially belong to the larger emotion construct and attempts to separate the processes can potentially distort our understanding of emotional processes. On the other hand, poorly regulated emotions can have some detrimental physiological and psychological effects. This means that investigations of ER processes are essential for understanding optimal functioning. Therefore, separating the constructs according to the two-factor model can serve other benefits.

Arguments for the two-factor model are varied. One argument is that ER is not merely the down-regulation of negative emotions and the up-regulation of positive emotions. As has been mentioned above, each specific emotion is potentially regulated differently or can potentially be regulating. Research evidence on the different strategies used in the emotion generation process model (Gross, 1998) has shown that emotions may be initiated or subdued, increased or decreased, and/or maintained when elicited based on individual-specific goals which in turn depend on environmental contingencies. For example, in nonclinical samples, expressive suppression strategies were used more often than re-appraisal strategies by those who experienced psychological distress and depression (Gross & John, 2002, 2003; John & Gross, 2004). Furthermore, outcomes of regulated emotions also provide evidence for the two-factor model. For instance, the employment of rumination in response to the experience of negative emotions has been shown to predict the onset, duration, and recurrence of depression (Morrow & Nolen-Hoeksema, 1990; Nolen-Hoeksema, 1991; Nolen-Hoeksema, Girgus, & Seligman, 1992). Moreover, evidence for the ongoing use of maladaptive ER strategies, such as suppression in regulating sadness, can be seen even after remission of depression (Ehring, Tuschen-Caffier, Schnulle, Fischer, & Gross, 2010). From an adaptive perspective, the ability to identify and label emotions in conjunction with an awareness of the experience of emotions increases the willingness to experience negative emotions and contribute towards better quality of life and life satisfaction (Gratz & Roemer, 2004; Hayes et al., 2006). Furthermore, suggestions for different pathways in the regulation of positive emotions are also being proposed and contribute to the argument for a two factor model. One pathway that has been suggested involves the dampening or suppression of positive emotions due to the experience of strong negative emotions. In an attempt to regulate negative emotions through suppression, positive emotions may consequently be suppressed also (Carl, Soskin, Kerns, & Barlow, 2013). In another pathway, positive emotions are regulated by savouring (positive mental reflections) or capitalizing (behavioural strategies used to upregulate) (Langston, 1994). Essentially, ER strategies are not limited to experiencing emotions only but are a complex, dynamic, and continuous response system that may be automatic or controlled (Gross & Thompson, 2007;

Kashdan & Rottenberg, 2010). In addition, neurobiological research has shown clear and observable links between the prefrontal cortex and ER processes (Owen, 2002). It has been shown that the prefrontal cortex and by extension ER processes plays a crucial role in regulating amygdala activity (emotional arousal), suggesting that neural correlates (i.e. the prefrontal cortex) of ER processes are different from the emotional arousal neural centre (Banks et al., 2007; Quirk & Beer, 2006).

In summary, evidential support for a two-factor model is more plausible than a one-factor model; however, ER theorists acknowledge that the distinction is not clear cut. For example, Gross and Barrett (2011) suggest that the distinction could merely be due to the design of the study and that the two factor model provides a theoretical way to understand how ER processes and emotions interact with one another. Moreover, different specific emotions can potentially have different regulatory functions as suggested by Campos and colleagues. From another perspective, it seems that ER strategies are capturing a broader set of processes than just the experience of emotions. For example, worry, rumination, thought suppression, and automatic negative thoughts are components of reflexive processes in emotion dysregulation (Gruber, Eidelman, & Harvey, 2008; McLaughlin & Nolen-Hoeksema, 2011; McLaughlin, Mennin, & Farach, 2007; Wenzlaff & Luxton, 2003). Moreover, repetitive negative thinking, a cognitive common factor in rumination and worry, is involved in the maintenance of emotional problems in a range of Axis I disorders (Ehring & Watkins, 2008). Repetitive negative thinking has also been posited to represent a transdiagnostic factor in various psychological disorders (Ehring & Watkins, 2008). The evidence and arguments from both sides show that a clear cut one factor or two factor model is difficult to achieve. Other researchers have suggested that due to a lack of consensus of an operational definition of ER, a meaningful distinction between ER and emotions remains elusive (Chambers et al., 2009). Moreover, current ER definitions and models may be lacking in their recognition of other inherent processes that are relevant in mental health problems (Bonanno & Burton, 2013; Chambers et al., 2014). In the next section,

the definition of emotion regulation and various emotion regulation strategies are discussed along with more recent research on effective emotion regulation styles and processes.

2.1.2 Emotion Regulation

2.1.2.1 Definition and Emotion Regulation Strategies

Research in emotion regulation (ER) is maturing and has become an independent field of study from research on emotion (Tamir, 2011). However, the field of emotion regulation is still relatively new and there is little consensus on a precise definition of ER. An inclusive definition is provided by Thompson (1994): “emotion regulation consists of extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions, especially their intensive and temporal features, to accomplish one’s goals” (pp. 27-28). In this definition, a functional view of ER is presented as emotions satisfy some kind of function based on individual-specific-goals and the context of the emotion-eliciting situation (Thompson & Goodman, 2010). ER has also been defined according to what they target and their function. Koole (2009) identified three types of emotional responses that are targeted in ER; attention, knowledge, and embodiments. The function that ER strategies serves are mainly hedonic needs, goal-orientated functions, and person-orientated functions (see Koole, 2009 for further details). Several more definitions have been used to describe ER concepts. ER can also be referred to as a subjective experience or an emotionally-related response that includes concurrent changes in cognitions, behaviour, and physiology (Bridges, Denham, & Ganiban, 2004; Gross, 1998). Alternatively, ER can be conceptualized in terms of appraisal (e.g. perceptual) or bottom-up processes and cognitive or top-down processes such as volitional attention and working memory (Bell & Wolfe, 2004). In addition to conventional definitions of ER, research in mindfulness is increasingly showing that different facets of mindfulness facilitate emotion regulatory processes, including awareness of emotions, being nonjudgmental and nonreactive, and being more accepting of emotions (Boulanger et al., 2010; Gratz & Roemer, 2004; Hayes et al., 1999).

ER is also closely related to coping but first an understanding of coping in the stress literature is necessary before making any comparisons. Coping came into focus many decades

ago when Lazarus (1966) argued that stress consisted of primary appraisal, secondary appraisal, and coping processes. As mentioned in the appraisal section of emotions, primary and secondary appraisal potentially occurs prior to the elicitation of an emotion when an individual interacts with a particular situation (Gross, 1998). If the situation is perceived as stressful, then negative emotions may be elicited. Coping is the process of managing the perceived stress through cognitive and behavioural efforts (Lazarus & Folkman, 1984). Although appraisals and coping overlap, they are also distinct processes in some ways. Coping is more involved with the management of the perception that has been created or developed through appraisals and therefore certain coping strategies that include efforts to deal with the stressor are used in order to bring about changes to the situation. Coping has been classified as problem-focused coping and emotion-focused coping (Folkman & Lazarus, 1980). Problem-focused coping involves strategies used to alter the sources of stress while emotion-focused coping are attempts to manage or reduce emotional distress associated with the situation. Although the two types of coping are distinct, they tend to overlap the other. When people feel that they can cope with the situation through constructive means, then problem-focused coping dominates and people often use strategies such as positive reappraisal and problem-solving. In contrast, when emotion-focused coping dominates, then people have the feeling that the distress is to be endured and they may tend to engage in strategies that impede adaptive coping such as cognitive suppression, avoidance, or escape (Folkman & Lazarus, 1980).

Differences and similarities between coping and emotion regulation are mainly concerned with the object of regulation (i.e. emotions and emotion components). These differences can be better understood from a problem-focused coping perspective. Coping involves more than just the regulation of emotions as coping responses (e.g. problem-solving, reappraisal) are aimed at changing the situation which may or may not elicit emotions or involve emotions (John & Gross, 2009). Further, coping can also be distinguished from ER based on whether the response was used to regulate emotional behaviours and/or physiological responses in managing emotional distress. On the other hand, ER conceptually overlaps with

emotion-focused coping when both are concerned with efforts to manage or reduce the impact of negative emotions (Losoya, Eisenberg, & Fabes, 1998). For example, Silk, Steinberg, and Morris (2003) used a coping questionnaire that also measures wide-ranging emotion-focused coping strategies to assess how children and adolescents regulated real-time emotional experiences. The increased use of coping questionnaires with the intention to measure ER processes, particularly in the past few decades, has largely spurred the emergence of ER as an independent construct. Moreover, the observation that cognitive strategies, particularly cognitive reappraisal, can be used for reducing stress responses and can result in benefits for psychological health led to further integration of coping and ER strategies. The early studies of appraisal and coping were also adopted by appraisal emotion theorists and have subsequently been adapted into a process model of emotion by Gross (1998).

The process model of emotion is based on the functional view of emotions that evaluations commence when internal or external emotional cues are detected in a situation (Gross, 1998). An emotion starts unfolding when a stimulus is perceived (or appraised) within a context and the process of attending to its features commences. Emotional components, such as behavioural, physiological, and experiential, are triggered due to certain evaluations and response tendencies that become activated according to perceived threats and opportunities (Gross, 1998). The triggering of evaluation and modulation processes also triggers corresponding emotion regulatory strategies. Emotions have been proposed to be regulated either before full-blown emotional responses arise (i.e. antecedent-focused) or after (i.e. response-focused). Antecedent-focused strategies are likely to influence the generation of an emotion while response-focused strategies influence emotional response tendencies when an emotion has already been elicited. ER processes employed before an emotion is elicited include; situation selection, situation modification, attentional deployment, and cognitive change. Correlational studies have shown how people select and avoid situations, including studies that have shown how caregivers alter the emotional experiences of infants. Very few studies have used experimental designs to test situation selection and modification while more

studies have examined attentional deployment and cognitive change. ER processes used after an emotion is elicited are called response modulation strategies. The majority of correlational and experimental ER studies have examined response modulation strategies in connection with psychopathology and well-being variables. Accumulated evidence shows that response modulation strategies predominantly contribute to psychopathological processes. The process model of emotion is called the emotion generation process model (used interchangeably with the process model of emotion regulation; Gross, 1998). The emotion generation process unfolds over time and the impact of ER strategies depends on the stage in which it unfolds in the emotion generation sequence.

Regulatory and coping strategies that are used before an emotion is elicited are often called reappraisal strategies while strategies used after an emotion is elicited fall in the category of suppression. Reappraisal strategies are often thought to be effective in regulating affect and physiological arousal as they target emotion-related knowledge. In comparison, suppression strategies refers to either the suppression of experience or expression strategies and adversely affects cognition and physiology as they target bodily and behavioural responses. There is a plethora of regulatory strategies that focus on cognitive, behavioural, and physiological aspects of regulation. These strategies either occur as a part of the emotion generation process or can be classified as variations of reappraisal strategies or of suppression strategies. Some examples of these strategies in the ER literature are presented here: emotional awareness, emotion identification, rumination, distraction, problem-solving, cognitive restructuring, social support, information seeking, engagement, helplessness, avoidance, escape, denial, inaction, wishful-thinking, self-reliance, social isolation, negotiation, opposition, acceptance of emotions, mindfulness practice, perspective-taking, self-harm, catastrophizing, self-blame, other-blame, exercise, relaxation, alcohol use, cigarette smoking, drug use, eating, and restricting eating (Aldao & Nolen-Hoeksema, 2010; Chaplin & Aldao, 2013; Gross, 2007; Zimmer-Gembeck & Skinner, 2011). Some strategies such as problem-solving, cognitive reappraisal, engagement, social support-seeking, relaxation, acceptance, and mindfulness are considered more adaptive.

In contrast, maladaptive strategies can either be categorized as forms of avoidance or as over-engagement strategies (Hayes & Feldman, 2004). Experiential avoidance is a type of an avoidant maladaptive strategy in which emotions, thoughts, images, memories, and physical sensations are avoided. At times these strategies can be useful but its persistent use can outweigh its initial benefits and can become ineffective in the longer term. Experiential avoidance underlies many forms of avoidant strategies that are often manifested as distraction, denial, cognitive distortion, suppression, repression, substance abuse, self-harm, disengagement, social isolation, and suicide (Hayes & Feldman, 2004). Over-engagement strategies is regulation that involves being preoccupied and consumed by the emotional experience and results in the use of strategies such as rumination, worry, obsessions, compulsive behaviour, or impulsive behaviours (Hayes & Feldman, 2004). In addition to the strategies mentioned, self-regulation also plays a role in coping and ER.

Emotional Self-Regulation

The multifaceted aspect of processes in ER is also a reflection of self-regulatory attempts to manage emotions. The ability for self-regulation begins early in life commencing from attempts to regulate distress during infancy and learning how to focus, shift, or inhibit attention during the toddler years. At first, caregivers provide the needed regulation to calm distress or aggressive outbursts but as development occurs, children learn how to apply effortful control and start to become more proficient at self-regulating their distress. Children learn how to self-regulate adaptively by actively distracting themselves and shifting their attentional focus on more pleasant stimuli in the environment (Denham, 1998). However, some children are unable to master self-regulatory strategies during the preschool years and this has been shown to impair personality development and social competence (Kochanska, Murray, & Harlan, 2000), the development of theory of mind (Izard et al., 2011), and school success and cognitive growth (Macklem, 2008). These self-regulatory strategies have also been called emotional self-regulation. To a certain extent, self-regulation can become automatic/unconscious processes as these regulatory processes have been learned and conditioned in childhood and eventually

influence regulatory processes in adolescence and adulthood. In adults, failures in self-regulation have often been observed as underregulation (lack of self-control) and/or misregulation (misguided/counterproductive self-control; Carver & Scheier, 1981). Self-regulation consists of three important aspects, namely standards/goals, monitoring, and the operation phase (Baumeister & Heatherton, 1996). Impairments to self-regulation occur when standards or goals are lacking or are in conflict amongst each other, when the ability to monitor or track one's actions and its effects are lacking or the inability to judge one's situation is inaccurate, and when the inability to override impulses (default programming, habits, motivations) is hampered (Baumeister & Heatherton, 1996). Emotional self-regulation is therefore the ability to engage with or disengage from one's standards or goals by keeping track of one's behaviour and directing it to achieve a desirable outcome even in the presence of emotional impulses.

The purpose for the need to self-regulate plays an important part in the regulation of emotions. People often regulate emotions in order to feel a certain way. One of the most prominent reasons for regulating emotions is to maximize hedonic feelings or to maximize immediate pleasure and minimize or avoid unpleasant ones. People also want to maximize useful emotions and minimize harmful ones. Therefore, what people want to feel depends on both the maximization of pleasure and its utility/usefulness (Tamir, 2009). When the maximization of or the preference for immediate pleasure is emphasized, then short-term benefits are obtained at the expense of long-term benefits. On the other hand, when the usefulness of an emotion is preferred, then long term benefits are likely to outweigh short-term benefits. Essentially, goals specify whether people will pursue feelings of pleasure or usefulness. But pursuing a goal can be conscious or unconscious depending upon the ability to reason or on implicit learning. Moreover, context determines goal preferences which in turn influence emotional preferences. Research has shown that the self-regulation of emotions in pursuit of immediate pleasure (the goal) can contribute to dysfunctional ER that can be observed in for example, eating disorders and alcohol abuse. In contrast, when people learn how a

particular emotion can be useful in a particular context, then they are more likely to override short term benefits in order to reap long term benefits (Tamir, 2009). For example, people may be willing to experience unpleasant emotions such as anger when it has been demonstrated to be useful in certain contexts (Tamir, Mitchell, & Gross, 2008). Research in ER is increasingly drawing from broader self-regulatory models that range from automatic/unconscious regulatory processes to more conscious, flexible, and open regulatory processes (an expanded discussion can be seen in section 2.1.2.3; Westphal & Bonnano, 2004). Furthermore, self-regulation does not solely occur through the individual but is often influenced by others and the environment, or in other words the context in which it occurs.

Such a wide array of strategies coupled with multidimensional aspects of ER included under one umbrella has rendered it almost impossible to define ER. This broad approach considers any action or nonaction as ER. But nevertheless, the majority of researchers agree that ER is concerned with the modulation of certain aspects of an emotional experience or response that can be adaptive or maladaptive, automatic or conscious/effortful processes (Campos, Campos, & Barrett, 1989; Eisenberg & Spinrad, 2004; Gross, 1998). In sum, adaptive ER involves the ability to modify or reduce the intensity and/or frequency of aversive emotional states and the capacity to generate and sustain emotional states that contribute to psychological health. Maladaptive ER can either be referred to as the absence of adaptive strategies to regulate responses to emotions that fosters goal attainment, or the use of a narrower range of strategies that may not be effective (Aldao & Nolen-Hoeksema, 2012). Maladaptive ER tends to play a larger role in distress and psychopathology than adaptive ER (Aldao & Nolen-Hoeksema, 2010; Cairns et al., 2014).

Emotion Dysregulation

Maladaptive ER can also be known as deficits in ER or emotion dysregulation. Generally, individuals who engage in a smaller subset of regulatory strategies are likely to experience emotion dysregulation and reduced socio-emotional well-being in the long term (Bonanno et al., 2004). Emotion dysregulation has been implicated in a broad range of

psychopathological symptoms and behaviours (Aldao & Nolen-Hoeksema, 2010; Cisler et al., 2010; Gross & Thompson, 2007) and have been identified in Axis I and Axis II disorders in the various versions of the Diagnostic and Statistical Manual for Mental Health (American Psychiatric Association, 1994). Longitudinal and experimental studies suggest that ER deficits are not only correlates of psychopathological symptoms but are also significant antecedents of mental illness (Berking, Wirtz, Svaldi, & Hofmann, 2014; Liverant, Brown, Barlow, & Roemer, 2008). Emotion dysregulation is increasingly emerging as the underlying factor in the development and maintenance of psychopathology.

Emotion dysregulation behaviours can be reported as under-regulation and over-regulation of emotional content. Emotion under-regulation can be referred to as deficits in regulating the experience of intense emotions. It is common in post-traumatic stress disorder, borderline personality, and the various anxiety disorders. On the other hand, emotion over-regulation can be observed in obsessive-compulsive disorder and bipolar disorder, particularly the manic phase. By far, problems of emotion dysregulation are a key factor in depression and anxiety disorders (Campbell-Sills & Barlow, 2007; Mennin, Heimberg, Turk, & Fresco, 2005). Additionally, emotion dysregulation can also be seen in clinically relevant behaviours including deliberate self-harm (Gratz & Chapman, 2007; Gratz & Roemer, 2008), substance abuse (Fox, Axelrod, Paliwal, Sleeper, & Sinha, 2007; Fox, Hong, & Sinha, 2008), and binge eating (Leahy, Crowther, & Irwin, 2008; Whiteside, Chen, Neighbors, Hunter, & Larimer, 2007).

2.1.2.2 Summary of the Current Research of Prominent Emotion Regulation Strategies

The large body of evidence in coping and emotion regulation strategies (as demonstrated in the previous section) has culminated into a greater understanding of how people respond to and adapt to ever changing situational contexts. Theories and associated constructs that emerged from the accumulated research have increasingly emphasized the dynamic nature of person-situation interactions and have provided considerable insight on the role of coping and ER in adjustment, yet there is a lack of understanding in how a particular ER strategy can be adaptive or maladaptive in different contexts due to diversity of situations and

emotional triggers. This lack of understanding can be attributed to the practice of categorizing coping and ER strategies as either adaptive or maladaptive (Bonanno & Burton, 2013).

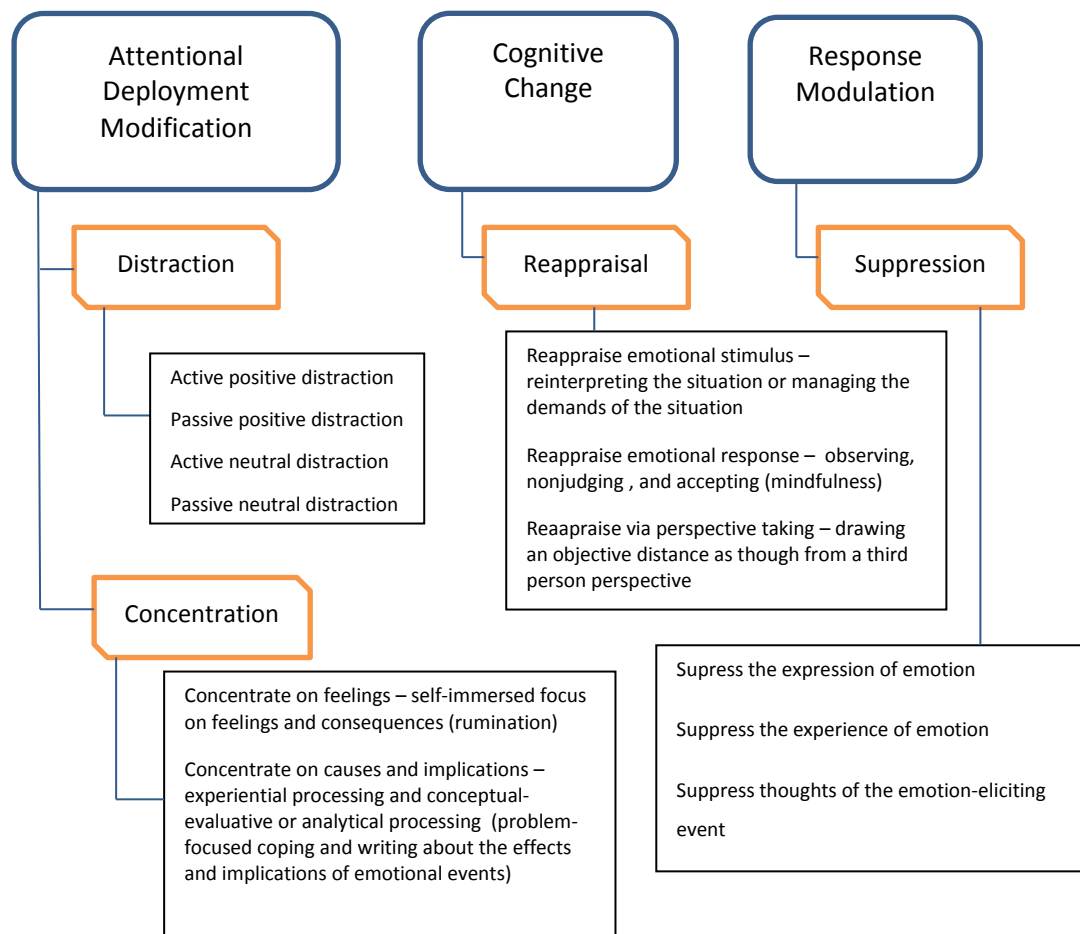
Adaptive ER strategies have been considered healthy and are associated with well-being while maladaptive ER strategies have been considered unhealthy and are associated with psychological difficulties (Aldao, Nolen-Hoeksema, & Schweizer, 2010; John & Gross, 2004).

More recently however, research on ER has been showing that emotions can be regulated in many different ways and that the different ER strategies have different consequences in different contexts, irrespective of being adaptive or maladaptive (Sheppes et al., 2014).

Moreover, multiple different strategies can also be used in the same context in order to obtain optimum results and by the same token, the same strategies can be used in different situations with deleterious effects. Research has indicated that a specific coping or ER strategy can influence mental health outcomes in various ways rather than in uniformity to the predictions of the categorized assumptions (Folkman & Moskowitz, 2004). Examples of this new generation of ideas can be seen through novel findings in rumination and suppression. But first, an introduction of where these strategies are located in the emotion generation process model is provided along with a brief description of the differences in strategies.

Webb, Miles, and Sheeran (2012) developed a taxonomy of the relationships between ER processes and specific ER strategies by combining conceptual frameworks of Koole (2009) and the emotion generation process model (Gross, 1998) in an attempt to show how different definitions of ER and ER strategies are more similar than different. According to the taxonomy, three ER processes, namely, attentional deployment, cognitive change, and response modulation, were identified in the ER experimental literature and these were linked to specific ER strategies that have been extensively investigated. Furthermore, findings from the meta-analysis also supported the conceptual distinctions between the three processes in the emotion generation process model described by Gross (1998). Figure 2 below is a representation of the taxonomy.

Figure 2.2 ER processes and corresponding ER strategies



In the attentional deployment category, various forms of distraction and concentration have been the focus of many studies. Distraction can be effective when it is more active (intentionally thinking of unrelated thoughts to the emotion or emotion-related stimulus; Masuda et al., 2010) than passive (engaging in tasks unrelated to the emotion or emotional stimulus; Donaldson & Lam, 2004) and when more distinct emotionally positive material is presented in comparison to emotionally neutral material (Shepley, 2006). Similarly, concentration can be effective when the focus is applied towards processing experiences, evaluating and analysing the situation, and arriving at a problem-solving mode (Kross, Adyuk, & Mischel, 2005; Watkins & Teasdale, 2004). In contrast, concentration can be psychologically detrimental when attention is directed towards feelings and their consequences. This is also called rumination (Nolen-Hoeksema, 2000). Rumination is the tendency to focus on the experience of negative emotions, its causes, and consequences in a repetitive manner (Nolen-

Hoeksma, Wisco, & Lyubomirsky, 2008). Although the purpose of rumination is to understand the source of distress, engagement in rumination paradoxically increases negative mood-congruent cognitions, restricts problem-solving, hinders instrumental behaviour, and prevents others from providing social support (Lyubomirsky, Kasri, & Zehm, 2003). It has been suggested that when a re-immersion in the experience of emotions occurs, it heightens the feeling of the emotion and often results in maladaptation (Mor & Winquist, 2002; Nolen-Hoeksma, 2000).

In the category of cognitive change, ER strategies can take the form of a reinterpretation of the emotional experience. According to Webb and colleagues, cognitive change includes acceptance and qualities of mindfulness such as being nonjudgmental by observing the ongoing stream of thoughts and feelings as they arise (Brown, Ryan, & Cresswell, 2007). Mindfulness and acceptance eventually contributes towards reappraisal and a change in perspective (Holzel, et al., 2011). Findings from the meta-analysis that compared the three broad processes in the figure above showed that strategies involving cognitive reappraisal were the most effective in comparison to attentional deployment and response modulation (Webb, Miles, & Sheeran, 2012).

Response modulation can be referred to as ER strategies that seek to alter the physiological, experiential or behaviour when response tendencies have been activated (Gross & Thompson, 2007). Suppression occurs in many forms and is also considered a form of avoidance. Suppression involves attempts to suppress expression, experience, and thoughts. Expressive suppression is the attempt to hide or inhibit the expression of ongoing emotional behaviour and/or emotional experience (Gross & John, 2003) while thought suppression is the attempt to stop thinking about unwanted thoughts (Wegner, 1994). Attempts to control or suppress emotions often lead to a paradoxical increase in its frequency and intensity because people experience a rebound effect (Wegner, 1994).

Suppression and rumination has been found to be the most widely used maladaptive strategies as reported in a meta-analytic study (Aldao, Nolen-Hoeksma, & Schweizer, 2010).

Moreover, suppression and rumination strategies have been found to be strongly associated with symptoms of depression, anxiety, eating disorders, and substance use in comparison to the weak associations of adaptive strategies such as reappraisal and problem-solving (Aldao, Nolen-Hoeksema, & Schweizer, 2010). Suppression and rumination have consistently emerged as potent risk factors for the emergence and maintenance of psychopathology among other emotion regulation strategies (Aldao & Nolen-Hoeksema, 2010). But from another perspective, the effects of suppression and rumination also depend upon the context or the situation in which these strategies are used.

According to the emotion generation process model by Gross (1998), emotion dysregulation usually occurs after an emotion is elicited when an appraisal is made. As proposed by Gross (1998), expressive suppression is used as an attempt to modulate the response to the appraisal of an emotion. Accumulated evidence has shown that expressive suppression can be considered maladaptive but the goal of suppression is also an important consideration. The first goal may entail the suppression of the expression of an elicited emotion. This goal can be an effective strategy or an ineffective strategy depending upon the context. The second goal may be an attempt to suppress the internal experience of the emotion and associated thoughts. The suppression of emotions and associated thoughts in both clinical and nonclinical populations has generally been accepted as an ineffective strategy as suggested in self-regulatory models such as emotional inhibition and experiential avoidance (Boulanger, Hayes, & Pistorello, 2010; Lynch, Robins, Morse, & MorKrause, 2001). But the expression of an emotion may also be considered appropriate for a specific situation. For instance, suppressing feelings of disgust when confronted with the illness of a loved one is considered a better option than expressing it. In other words, suppression, especially expressions of emotion, operate as important social and communicative functions (Parkinson, Fischer, & Manstead, 2005). In certain contexts, suppression may be beneficial especially in Eastern cultures when compared to Western cultures (Butler, Lee, & Gross, 2007) and in situations that involve excess adversity (Bonanno & Keltner, 1997). In essence, neither expression nor suppression of

emotions is as crucial for adjustment as is flexibility in relation to the demands of the situation (Bonanno, Papa, Lalande, Westphal, & Coifman, 2004).

Similarly, rumination has predominantly been cast as a maladaptive ER strategy as dwelling on negative aspects of the self has consistently been shown to function as a core diathesis for the emergence, maintenance, and recurrence of depressive episodes. In contrast, moving attention away or distracting oneself from emotional processing can counter the effects of rumination. From another perspective, rumination can also be advantageous in situations where a goal requires single-minded attention amid distractors (Altamirano, Miyake, & Whitmer, 2010) as distraction can be maladaptive when long-term adjustment is involved (Kross & Ayduk, 2008).

It can be concluded that the existing understanding and knowledge of ER strategies can be viewed as incomplete based on findings from the various meta-analytic studies. In the meta-analytic study conducted by Webb et al. (2011), different ER processes (attentional deployment, cognitive change, and response modulation) have been shown to be conceptually distinct but significant differences between them were found to be modest. However, an unexpected and important finding showed robust findings for the use of the same strategy in different contexts, which highlighted the need to examine ER strategies from a different perspective. These findings suggest that individuals are likely to use a particular strategy in many situations as deemed appropriate but this could also mean that the same strategy is used indiscriminately, thereby reducing effective regulatory behaviour. For example, findings for expressive suppression revealed that when the expression of emotions was suppressed, it was generally effective but the suppression of emotional experiences and associated thoughts were generally ineffective. This suggests that the suppression of expression may have been justified in certain contexts as the intention underlying the suppression may have been appropriate for the situation. On the other hand, suppression is generally ineffective as the suppression of emotional experience is more of an intrapersonal modulating strategy that can prevent awareness of the experience and thereby also prevent the processing of other accompanying information that

allows for clarity of the emotional experience. Therefore, the indiscriminate use of suppression can result in ineffectiveness in the longer term. Likewise, the widely acknowledged role of reappraisal as an adaptive ER strategy was also found to be less effective in comparison to using perspective taking or the reappraisal of the context in the elicitation of emotion or the cause of the emotion.

Furthermore, the process model of emotion generation has been used widely but it seems like categorizing ER strategies as antecedent-focused and response-focused categories or as adaptive and maladaptive may not portray the whole picture of why people regulate emotions in different ways in different contexts. For example, large distinctions among ER strategies have mainly been found to be between the use of cognitive strategies and behavioural strategies according to a meta-analysis of ER strategies (Augustine & Hemenover, 2009). It was also found that behavioural (avoidance and engagement) strategies outweighed cognitive (avoidance and engagement) strategies in repairing affect effectively, possibly due to ease of implementation. This could also be due to the proclivity of people to recall behavioural rather than cognitive responses. For example, the use of avoidance strategies outweighed use of engagement strategies possibly due to the ease in avoiding rather than directly dealing with negative affect through journal writing or seeking constructive support from others (Augustine & Hemenover, 2009). Moreover, wide variances between similar strategies were also observed. This meta-analysis has shown that categorizing ER strategies may not necessarily help in gaining a better understanding of how and when ER strategies are used which subsequently influences our incomplete understanding of the regulation of emotions. As has been shown, people are likely to use certain strategies over others as they may consider those strategies suitable for the situation.

An emerging aspect in understanding emotional experiences is shifting towards the interaction between the person and the context. Although this idea is not new, research in coping and ER has predominantly focused on a few strategies rather than on this aspect. Most importantly, researchers from both cognitive and behavioural traditions have begun to converge

in their conclusions regarding the choice of ER strategies. People use different strategies in different situations based on what is deemed appropriate in the particular context rather than on adaptive or maladaptive features of the strategy. Given our current understanding about the use of ER strategies, researchers have started addressing flexibility in the use of ER strategies.

2.1.2.3 Flexibility in the use of Emotion Regulation Strategies

Findings from an increasing number of studies are now showing that benefits of ER strategies depends upon the context (i.e. the person situation interaction) and this calls for flexibility in using the most appropriate strategy for the situation. Moreover, research is also showing that the flexible use of ER strategies has long term consequences on mental health and well-being. Accordingly, Bonann and Burton (2013) have advanced a model of self-regulation that emphasizes flexibility in coping and emotion regulation. The broader construct in this model is referred to as Regulatory Flexibility and includes processes such as context sensitivity (perceived impinging demands and opportunities), the repertoire of regulatory strategies (wide-ranging strategies accommodating contextual demands), and responsiveness to feedback (ongoing monitoring of efficacy of strategies for behavioural adjustment). The premise for the emergence of this broader construct is based on individual differences in self-regulation and the use of the most effective regulatory strategies that fulfil its functional purpose. However, a deeper understanding of the role of context in regulatory strategies is important to clarify for the purpose of this thesis.

Context is a slippery construct but it can be referred to as interrelated circumstances that surround a situation, an event, or a process (Aldao, 2013). Based on this concept, context is often relative and therefore its operationalization can also be relative to what context means in regulatory strategies. Context can be organized into four broad categories that include (1) the personal characteristics of an individual, (2) the stimuli in the environment that triggers an emotion, (3) the strategy choice and implementation involved, and (4) the kinds of outcomes expected (for a more detailed discussion of the broader construct of context, please see Aldao, 2013). From a regulatory flexibility perspective, context consists of characteristics of the

organism which can be referred to as abilities to perceive changes in the environment in relation to the self and choosing to respond accordingly. This is also what is meant by context sensitivity (the meaning of context sensitivity will be further elaborated in the mindfulness and PF sections). In the wider literature, context has been lumped together to include a variety of contextual characteristics but a majority of the characteristics are more concerned with emotion-eliciting stimuli in the environment or types of outcomes expected such as hedonic vs. instrumental or short vs long term. Some of the contextual characteristics that have been the focus of empirical and theoretical papers are presented below.

Over time, past research has highlighted that the shifting nature of contextual demands play a crucial role in the choice of regulatory strategies. Several contextual characteristics that have been deemed important in determining variability in the efficacious use of ER strategies have been attributed to controllability of the stressor (Carver & Connor-Smith, 2010; Folkman & Moskowitz, 2004), aspects of the person (demographics, personal psychological characteristics, cognitive factors, and psychopathology), external stimuli in the elicitation of emotion (environmental factors such as interpersonal processes or uncontrollable external factors), ER strategy selection and implementation (instructed vs. spontaneous selection of strategies or acceptance vs. reappraisal), kinds of outcomes assessed (different effects of emotional components, hedonic vs. instrumental expectations, short vs. long term effects) (Aldao, 2013), cultural and social influences that contribute to variability and their subsequent consequences, regulatory choice in the emotion generation process (Sheppes, Scheibe, Suri, & Gross, 2011), and cognitive and motivational factors (e.g. financial rewards and long term goals; Sheppes et al., 2012). Although these contextual characteristics overlap with and influence regulatory strategy choice, Bonanno and Burton (2013) have emphasized that the interrelated combinations of the suite of regulatory processes are dynamic and vary according to the stressor rather than being stable and uniform in nature. In this sense, the regulatory flexibility construct extends beyond the multiple contextual characteristics and can be viewed as a multidimensional construct that assesses varying underlying processes used for responding to

shifting contextual demands. This idea of context-based coping and ER has contributed to a growing body of research and has opened up a new understanding of how intrapersonal flexibility can influence the optimal utilization of ER strategies.

Furthermore, the recent understanding of flexibility in the use of ER strategies has also led to other different conceptualizations and names for ER. Flexibility has been referred to as Emotion Regulation Choice (Sheppes, Scheibe, Suri, & Gross, 2011). The underlying idea introduced by the researchers encompasses similar context-related ideas about flexibility in using ER strategies. People generally adapt their emotions to suit the needs of the situation (Gross, 2007; Koole, 2009). Based on this notion, people make choices on how to regulate emotions according to situational demands as ER strategies have different consequences in different contexts (Sheppes et al., 2014). ER choice considers the stage at which ER strategies are used in the emotion generation sequence. For example, early engagement in reappraisal allows for a more elaborated capturing of important information and cognitive processing in preparation for an adaptive response in low intensity emotional situations and disengagement in the form of distraction at an early stage for emotional processing in high emotional intensity situations (Sheppes et al., 2011; Sheppes et al., 2014). These ideas have more recently been regarded as demonstrating good ER flexibility. In the framework of ER choice, disengagement in the form of distraction occurs earlier than reappraisal in the emotion generation process and is more often used for high intensity emotional situations (Sheppes et al., 2014). Moreover, long term costs and benefits need to be considered when using disengagement. Although benefits may result in less expenditure of cognitive resources, this comes at the expense of a loss in the ability to store and retrieve emotional information in working memory in the service of long term goals and functioning due to a lack of initial emotional processing (Sheppes & Meiran, 2007; Sheppes et al., 2009; Sheppes & Meiran, 2008). In the series of studies conducted by Sheppes and colleagues, regulatory choice has been demonstrated to be linked with well-being and psychopathology. A healthy regulatory choice in the form of reappraisal often leads to healthy adaptation while the repeated use of disengagement distraction can often result in

overgeneralization of the strategy and subsequently lead to maladaptation. Essentially, the choice in implementing whichever ER strategy is likely to have long term implications for the individual.

In addition to the reappraisal framework in ER choice, costs and benefits of reappraisal has also been shown to be dependent on the controllability of stressor context (Troy, Shallcross, & Mauss, 2013). The context of controllable (when changes can be made to a situation) and uncontrollable (when only the self can be regulated) situations seems to dictate whether reappraisal is an adaptive regulatory strategy. In Troy et al's (2013) study, reappraisal was unrelated and negatively correlated to psychological health in a controllable situation. In controllable situations, reappraisals for negative emotions may not be suitable as according to the functional view, emotions serve an adaptive purpose and so negative emotions serve the purpose of motivating people to take action. Reappraisal may influence inaction or the inflexible use of regulation and may therefore be maladaptive. On the other hand, reappraisal is effective when the stress is uncontrollable and where reappraisal can contribute to adaptive outcomes. This study provides further support for flexibility models that involve the flexible deployment of regulatory strategies according to demands of the situation.

The ability for flexibility or choosing an appropriate ER strategy requires a certain insight into the emotional functioning of the self in relation to the environment otherwise feedback processes can become haphazard and can be based on short-term consequences, thereby, unsuccessful in the long term. To a large degree, the ability for being contextually sensitive depends on an awareness or a presence of mind that alerts the individual to internal feelings when changes in the environment occurs. This then provides a platform from which to react or act. Additionally, the two stage model of affect regulation states that the inability to correctly identify emotional states often contributes to ineffective coping (Larsen, 2000). Research in children, adolescents, and adults have shown that emotional awareness is a prerequisite for competency in emotional functioning, particularly in balancing internal emotional states (see review by Kashdan, Barrett, & McKnight, 2015). The ability to identify,

label, distinguish, and express emotional states have been investigated under a variety of names and constructs. In the following section, a brief summary of emotional awareness and mindfulness is presented.

2.1.2.3.1 Emotional Awareness

Regulatory flexibility largely depends upon attentional awareness as conceptualized in emotional awareness (Lambie & Marcel, 2002) and the ability to focus on the present moment (also known as mindfulness; Brown & Ryan, 2003). In this section, emotional awareness will be discussed first, followed by mindfulness in the following section.

Emotional awareness has been defined as attentional processes that allow for interpretations and evaluations of emotions (Rieffe et al., 2008). Awareness of the evaluative, behavioural, and bodily aspects of an emotional state depends upon directional focus and mode of focal attention (Lambie & Marcel, 2002). Directional focus is attention that can either be directed to the self or to the world. Mode of attention can occur in two stages of awareness: (1) the immediate experience of an emotion that involves the degree of immersion or detachment with the object of attention and the degree of analytical or synthetic attention towards components or to a whole, to lower or higher description or category, and (2) an awareness that involves varying degrees of reflection, reporting, purposive recall, i.e. attention which is more characteristic of diffused attention such as relaxation and hypnagogic states (Lambie & Marcel, 2002).

In comparison to ER, emotional awareness assesses whether an individual can consciously experience emotional arousal as feeling states in the form of bodily sensations, a tendency to act, or to verbally express one's emotions. The conscious awareness of emotional components may differ in individuals and this most likely contributes to the experience of emotions and its regulation (Subic-Wrana et al., 2014). Differences in emotional awareness can be gauged in anxiety and depression. For example, a state of arousal may be experienced as restlessness but the conscious feeling of anxiety may be lacking, while another person may experience bodily sensations as anxious arousal and be able to consciously connect it with

anxiety. Similarly, a depressed individual may attribute social avoidance to feelings of exhaustion while another person may attribute the same to feelings of sadness or shame. An awareness of emotional components is crucial for connecting the links between emotional arousal and ER. If emotional awareness is appraised accurately, then there is greater possibility for successful ER. In contrast, if emotional awareness is lacking, then there is a greater possibility for ER to be unsuccessful, resulting in maladjustment. The importance of emotional awareness has been demonstrated in a study below.

A longitudinal study examined emotional awareness in early adolescents by using the TAS-12 (i.e. alexithymia) to predict specific positive (joy) and negative (fear, hostility, and sadness) emotions and PSS (Ciarrochi, Heaven, & Supavadeeprasit, 2008). The results indicated that the inability to identify emotions significantly predicted increases in fear and sadness (particularly in boys, not girls) and decreases in joy in the following year. Similar effects were found for perceived social support where the inability to identify emotions contributed to decreased perceptions of the number of social supports and satisfaction with them. This study provides some preliminary evidence for the importance of emotional awareness and also its importance in identifying specific emotions.

In the broader literature, “alexithymia,” defined as impairment in describing and experiencing emotions, has been observed as a deficit-based phenomenon of emotional awareness (Nemiah & Sifneos, 1970). In this regard, several measures for assessing the various aspects of emotional awareness have been developed such as the emotion expression scale for children (EESC; Penza & Zeman, 2002), the emotion awareness scale (EAQ-30; Rieffe et al., 2007), the Toronto alexithymia scale (TAS-20; Bagby, Parker, & Taylor, 1994), the alexithymia questionnaire for children (AQ-C; Rieffe, Oosterveld, & Terwogt, 2006), and the levels of emotional awareness scale for children and adults (LEAS; Lane, Quinlan, Schwartz, Walker, & Zeitlen, 1990; LEAS-C; Bajgar, Ciarrochi, Lane, & Deane, 2005). These measures have been developed independently and measure unique aspects of awareness but they also measure overlapping themes and concepts of emotional awareness. Some examples of overlapping

concepts include emotional expressions that portray awareness, bodily/physical awareness of emotions, awareness of other's feelings, and differentiating emotions. Despite the overlapping themes, research findings have shown that the various emotional awareness measurements do not measure the same underlying construct as demonstrated below.

Several studies in children, adolescents, and adults have examined the effects of poor emotional awareness in the emergence and maintenance of psychological disorders. Findings from most studies in children and adolescents have shown that poorer emotional awareness influences internalizing disorders (Rieffe, Oosterveld, Miers, Terwogt, & Ly, 2008; Zeman, Shipman, & Suveg, 2002) while only some studies have shown poorer emotional awareness influencing externalizing disorders (Casey & Schlosser, 1994). In a recent study with adolescents, the LEAS-C was found to be negatively correlated with the AQ-C, demonstrating that the underlying construct in the two measures were distinct (Vermain, Fontaine, & Van Ryckeghem, 2015). Among adults, emotional awareness as measured by the TAS-20, a self-report scale, has mainly been shown to be impaired in mental disorders such as depression, anxiety, adjustment disorders, and eating disorders. Whereas emotional awareness measured by the LEAS, differentiates between diagnostic groups in patients with body-related symptoms and those with other psychological symptoms. Low scores on the LEAS have primarily been associated with the tendency to experience emotional distress as bodily symptoms. Moreover, findings from a study comparing the TAS-20 and LEAS in inpatients showed that the TAS-20 specifically captured changes in negative affect while the LEAS captured changes in emotional awareness during the course of treatment (Subic-Wrana et al., 2005).

Findings from the small number of studies reviewed above suggest that the various emotional awareness measurements are assessing different aspects of emotional awareness. It appears that emotional awareness is an important construct for understanding individual differences in emotional experience but the varied research outcomes demonstrate that the emotional awareness construct is broader than what is assessed by each measurement. Even though the measurements have common underlying themes, they seem to be tapping into

distinct static characteristics of a disposition or trait of emotional awareness. Emotional awareness may consist of broader emotion identification skills than just the simple labelling of emotional states, such as the identification of different conflicting emotions, the identification of emotions in self and others, and identification of similarities between emotions (Lane & Schwartz, 1987; Saarni, 2000). Additionally, while dispositional assessments of emotional awareness provide valuable information about emotional processing, they may have limited value from a therapeutic point of view. For instance, it is widely accepted that alexithymia is difficult to treat as these individuals tend to have a historical pattern of emotional avoidance and ingrained maladaptive behavioural responding patterns used for emotion self-regulation. In this regard, mindfulness provides an alternative and broader view of attention and awareness that is more in line with emotional awareness as suggested by Lambie and Marcel (2002). Further, an increasing body of research is showing that the capacity for awareness can be enhanced through the training of attention in therapeutic settings.

2.1.2.3.2 Mindfulness

Mindfulness has been referred to as qualities of awareness but mindfulness is also considered a disposition. The original definition of mindfulness emerged from Buddhist psychology and emphasizes qualities of consciousness, such as moment-to-moment awareness and nonjudgment/nonreactivity (Kabat-Zinn, 1994). Awareness in mindfulness can be defined as “the conscious registration of stimuli, including the five physical senses, the kinesthetic senses, and the activities of the mind” (Brown, Ryan, & Cresswell, 2007, p. 212). A more contemporary understanding of mindfulness integrates Buddhist contemplative theory with Western psychological theories. Mindfulness can be defined as “the awareness that emerges through paying attention on purpose, in the present moment and nonjudgmentally to things as they are” (Williams, 2007, p. 47). Accordingly, mindfulness has been proposed as a two component process. The first component involves the self-regulation of attention for the purpose of focusing on the immediate experience of the present context rather than using past experiences to focus on the present context. These skills involve the ability to sustain attention,

recognize and switch back to the present moment when the mind wanders, and using a nonjudgmental awareness approach towards thoughts, feelings, and sensations. The ability to observe and become aware of one's thinking and cognitive processes is called metacognitive awareness. The second component involves approaching one's experience with acceptance and curiosity, irrespective of the valence and desired expectations of the experience. This allows one to observe the self and ever-changing flow of private experience. Mindfulness has also been proposed as a dispositional trait that is reflected in a multifaceted construct in which mindful attributes consist of acting with awareness, nonjudging, nonreacting, being able to describe experiences, and observing (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). Items in the multifaceted construct are usually referred to as mindful behaviours. Some individuals may naturally be mindful while for some individuals, mindfulness can become trait-like tendencies when appropriately trained.

Certain aspects of mindfulness have also been viewed to be similar and dissimilar to the theory of self-awareness with respect to attention and awareness. Conscious attention by nature can either be directed towards the self or towards the external environment at one moment in time. Self-awareness is concerned with conscious attention directed upon the self (Davis & Brock, 1975). Other names used for self-awareness are "objective self-awareness" or "self-focused attention." The theory underlying self-awareness postulates that when attention is focused on the self, then a series of self-evaluations also crop up when discrepancies are perceived to exist between the ideal self and one's achievements, thus contributing to lowered self-esteem and negative affect (Duval, Wicklund, & Fine, 1972). In contrast, when people are given positive feedback to avoid negative stimuli, then self-awareness can enhance positive affect (Duval, Wicklund, & Fine, 1972; Gibbons & Wicklund, 1974).

Similarities and differences between mindfulness and self-awareness often vary according to strength, direction, and kind of attention deployed (Brown, Ryan, & Creswell, 2007). Strength and direction of attention refers to the sufficient ability to bring attention towards both the inner and outer realms so that reflective consideration can be given to one's

goals. The strength in directing attention towards mental, emotional, and physical experience contributes to healthy self-regulation while a lack of sufficient attention contributes to habitual, automated, or overlearned responses that may not be situationally or contextually appropriate.

Differences between mindful and reflexive attention lie in the quality of attention deployed. Specifically, the purpose of consciousness plays a role in explaining these differences. The function of consciousness is both to monitor and control. The monitoring function is that of an observer while the control function is that of maintaining and/or changing responses in the direction of one's selected goals (Brown, Ryan, & Creswell, 2007). The control function is mainly concerned with the self-regulation of attention to stimuli in relation to self-relevant concerns and enhancement of identity and self-concept. Essentially, this kind of self-awareness can also be said to be a direct response to stimuli without "awareness" (Zuriff, 1986, p. 237-238). According to Zuriff (1986), there could be two levels of awareness of the self. The difference in the two levels can be gauged from the example wherein one might say "I see a tree" and "I'm aware that I see a tree." This example could potentially provide an explanation for the quality of attention deployed in mindfulness. The monitoring function in mindfulness serves as an observer of awareness rather than self-regulator of self-relevant cognitions. Becoming aware of awareness itself is in direct contrast to generating forms of cognition in pursuit of enhancing self-concept. This kind of conscious processing involves being in contact with the present moment so that inner and outer stimuli is captured accurately. It also introduces a mental gap between attention and its object for the purpose of creating space between consciousness and mental content (Martin, 1997).

Although mindfulness engenders qualities of consciousness, it is not necessarily equivalent to activities that enhance mindfulness. Mindfulness can be enhanced through practice and through mindfulness-based interventions in therapy. The most common means of cultivating mindfulness is through the practice of mindfulness meditation. Meditation is generally known as the training of attention and awareness for bringing mental processes into regulated control thereby fostering mental well-being and developing calm, clarity, and

concentration (Walsh & Shapiro, 2006). Many styles of meditation are currently being practiced and while it is assumed that all practices benefit practitioners equally, research has shown otherwise. Neurological studies have shown that different styles of meditation have different effects on brain activity (Cahn & Polich, 2006; Lutz, Dunn, & Davidson, 2007). For example, in comparison to concentrative forms of meditation (e.g., chanting of a mantra), mindfulness meditation has shown stimulation in the mid-prefrontal brain which is associated with self-observation and metacognition (Cahn & Polich, 2006; Siegal, 2007).

Qualities of mindfulness have been explored through the use of psychometric assessments. Various psychometric self-report measures assessing dispositional mindfulness have been developed, including the Freiburg Mindfulness Inventory (FMI; Wlach et al., 2006), the Kentucky Inventory of Mindfulness Skills (KIMS; Baer et al., 2004), the Five Facets Mindfulness Questionnaire (FFMQ; Baer et al., 2006), and the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003). Considerable similarities between the mindfulness measures have been observed, especially in aspects of awareness in mindfulness and attitude in acceptance, but there are also differences among them (Rau & Williams, 2016). For example, MAAS focuses on subjective experience of awareness while the KIMS and the FFMQ focus on dispositional mindfulness traits. Dispositional mindfulness measures have been shown to be positively related to meditation experience (Baer et al., 2008) and trait mindfulness is likely to increase with increased exposure to mindfulness training (Bowen et al., 2009; Carmody & Baer, 2008). Similar to dispositional mindfulness measures, behavioural-based measures of mindfulness attempt to capture interdependent overlapping processes in a multidimensional format.

Behavioural-based measures of mindfulness have been developed to capture intercorrelated processes such as acceptance, present moment awareness, cognitive defusion, self-as-context, clarity in values, and committed action on one end of the continuum and experiential avoidance and cognitive fusion on the other end of the continuum. The processes are behaviourally operationalized according to the function of the process rather than in terms of

disruptive cognitive patterns (Gillander et al., 2014). These measures are the Acceptance and Action Questionnaire (AAQ; Bond et al., 2009), and the Action and Fusion Questionnaire for Youth (AFQ-Y; Greco, Lambert, & Baer, 2008). The AAQ and AFQ-Y measure the Psychological Flexibility construct and is the emphasis in the ACT modality of mindfulness interventions. Researchers have used these mindfulness questionnaires as state and trait measures in both research and applied contexts for assessing the association of mindfulness with mental health and psychological well-being, quality of life, behavioural regulation, physical health, affect, cognitive performance, and quality of relationships. The AAQ has been shown to overlap considerably with other mindfulness (i.e. MAAS and FFMQ) and self-compassion measures and the AAQ has also been shown to predict larger variance in negative indicators of psychological health than the MAAS and FFMQ (Woodruff et al., 2013). For the purpose of this thesis, the behavioural-based measure of mindfulness (i.e. the AFQ-Y) has been used.

With the increasing use of mindfulness treatments for an array of psychological disorders and with disordered ER at the core of psychological disorders, researchers have proposed the integration between mindfulness and ER (Chambers, Gullone, & Allen, 2009). Evidence is accumulating for the significant overlap between mindfulness and ER. Attentional deployment in ER is not a new concept in Western psychology and is considered as one of the multiple strategies in the emotion generation process model (Taylor & Amir, 2010). Moreover, benefits of mindfulness practice have been observed in psychotherapy particularly in relation to affective, interpersonal, and intrapersonal improvements (Davis & Hayes, 2011). Based on these insights, links between mindfulness and ER are discussed further in the following section.

Mindfulness and Emotion Regulation

From an emotion regulation perspective, the practice of mindfulness helps develop a distance between internal and external experiences while allowing for more flexibility in choosing how to react to a particular situation. Mindfulness promotes self-regulation by enhancing the ability to selectively attend to positive stimuli and refrain from reacting to negative stimuli and allows for flexible responding to emotions and other internal states through

emotional acceptance. Mindfulness contributes to the effective regulation of emotions through decreased reactivity and increases flexible responding. The reduction in dysphoric reactivity is usually achieved through the development of metacognitive skills where tolerance for negative affect is fostered through a wider attentional frame (Teasedale, 1999).

Overlaps between mindfulness and effective self-regulation processes have also been observed. A mindful approach promotes regulatory flexibility (as mentioned in section 2.1.2.3 above) as being mindful allows one to consider the impinging demands and opportunities of the context-at-hand, use regulatory strategies that are most appropriate for the situation, and monitor and adjust ongoing internal cognitions, emotions, and behaviours (Brown, Ryan, & Creswell, 2007). Attributes of regulatory flexibility can be achieved when attentional deployment strategies are aimed at meeting the demands of the context. In this respect, mindfulness uses the same processes as regulatory flexibility whereby the decision to choose to respond depends upon its appropriateness to the situation and adjustments to behavioural responses are monitored through ongoing observation. On the other hand, being mindful is the opposite of self-controlled regulation (e.g. Baumeister, Bratlavsky, Muraven, & Tice, 1998). A mindful state is not a state of self-control where mental content is manipulated (e.g. suppression) but is rather a state of awareness of the internal thoughts and emotions occurring at each moment.

The above benefits of mindfulness contrast with avoidance and overengagement strategies when used for regulating emotions. Avoidance and overengagement strategies are likely to hinder the functional and adaptive nature of emotions through effortful control or the attempt to modify the intensity, frequency, and/or duration of emotions. Attempts to modulate emotions also involve an attachment to these efforts and therefore further efforts are required to dampen emotional arousal. This repeated cycle where more and more efforts are required are due to the rebounding effects of suppression. This is a reflection of the emotional control agenda which is indicative of experiential avoidance (this is further explained in the next section). On the other hand, mindfulness contributes to the functional and adaptive nature of emotions. The multidimensional benefits of mindfulness support behavioural control instead of

emotional control (Gratz & Tull, 2010). Behavioural control is concerned with the ability to inhibit impulsive behaviours or alternatively, acting according to one's goals or values in the presence of negative emotions (Linehan, 1993; Melnick & Hinshaw, 2000). This conceptualization of mindfulness overlaps with ER and is consistent with behavioural-based mindfulness and acceptance approaches of psychological treatment.

In comparison to the practice of cognitive-behavioural interventions working at the levels of reappraisal and response modulation, mindfulness is not a direct intervention for regulating moods and changing them. Instead, an observation of the ebb and flow of emotions and its associated thinking, behavioural, and physiological tendencies is encouraged. Observation allows one to become familiar with one's emotional repertoire and fosters tolerance for negative emotions, thereby reducing the influence of the intensity of emotions and its duration (Corcoran, Farb, Anderson, & Segal, 2010). With the cultivation of an open, accepting, unbiased awareness, and a wider attentional focus towards inner experience, the efficacy of one's behaviour and manifest action is also monitored. Neurologically, disengagement with previously learned automatic pathways is achieved through self-observation which results in the promotion of flexibility in the use of emotion regulatory strategies (Siegal, 2007). Input from the present moment allows for the integration of current information and results in the tailoring of responses to idiosyncratic features of the concurrent situation rather than the use of habitual reactions.

In conclusion, neuroscientific studies have shown that mindfulness allows for the engagement with or disengagement from the selected target while responding to the situation, thereby enabling emotional flexibility. These studies have also shown that rather than the top-down approach in ER, as in reappraisal, mindfulness produces dynamic equilibrium states in the brain, which in turn influences capability in the processing of moment to moment situations while reducing habitual elaborative processing. Furthermore, the neuroscientific evidence suggests that mindfulness enhances ER by expanding attentional capacity and metacognitive awareness and as a result, contributes to decreases in avoidance of thoughts and feelings, greater

ability for tolerating negative emotions, and reduces the overreliance on under-engagement or over-engagement ER strategies.

Although benefits of responding with a mindful approach as an alternative to conventional ER responding approaches is widely accepted, research is still lacking in how mindfulness and acceptance works as an ER construct. In the following section, psychological flexibility is proposed as a mindful emotion regulation construct.

2.1.2.4 Psychological Flexibility as Mindful Emotion Regulation

The enhancement of mindfulness and acceptance skills in therapy became more widespread with the advent of the “third wave” of cognitive-behavioural therapies (CBT) such as Mindfulness-Based Cognitive Therapy (MBCT; Segal, Williams, & Teasdale, 2001), Dialectical Behaviour Therapy (DBT; Linehan, 1993), Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999), Functional Analytic Psychotherapy (FAP; Kohlenberg & Tsai, 1995). The newer approaches of CBT differ from the traditional and 2nd wave of cognitive therapies on philosophical, scientific, and clinical grounds (Hayes, 2004, more details are discussed in chapter 3). One major difference worthy of mention here is that symptom alleviation is not specifically sought but instead the goal is to promote mindfulness and acceptance through behaviour change methods. In particular, ACT aims to enhance psychological flexibility (PF). In fact, the PF construct can be viewed as core processes of mindfulness which is defined as “the ability to contact the present moment more fully as a conscious human being, and to either change or persist when doing so serves valued ends” (Hayes et al., 2004, p. 5). The PF construct can be used to represent the extent to which individuals are dispositionally mindful or those who have achieved a certain level of mindfulness through mindfulness practice or through mindfulness promoting interventions as in ACT.

Processes inherent in PF stem from the ACT model and are based on behavioural principles that focus on verbal behaviour called Relational Frame Theory (RFT). Psychological flexibility is the ability for directing flexible attention to the present moment, being accepting of

psychological distress in the context of valued action, defusing from the content of speech and thinking, engaging in discriminating the “self” from aversive thoughts and feelings, committing to action that is in the direction of chosen values even in the presence of distressing thoughts and emotions, and focusing on values that improve vitality and meaning in life (Blackledge & Barnes-Holmes, 2009; Hayes, Strosahl, & Wilson, 2012). This is considered the ACT model of psychological well-being. On the other hand, psychological *inflexibility* occurs when attention is dominated by certain kinds of rule-governed behaviour that leads to avoidance, loss of present moment awareness, fusion, lack of clarity in values, and a lack of committed action. This can be called the ACT model of psychopathology (Levin & Hayes, 2009). Many of these processes overlap considerably and therefore exclusive measures that assess a single process can lose its meaning (Levin & Hayes, 2009). Therefore, the PF construct was developed to measure the continuum of mindfulness and acceptance on one end and experiential avoidance and cognitive fusion on the other end (this is further expanded in Chapter 3). Additionally, the clinical utility of these processes have been supported in component studies that examined the function of these intervention processes in a recent meta-analysis (Levin, Hildebrandt, Lillis, & Hayes, 2012).

ACT is more commonly known as a treatment program that uses mindfulness and acceptance strategies along with behavioural change techniques for the treatment of underlying behavioural problems. Essentially, the aim is to increase PF by focusing on the context and the function of psychological events instead of the form, content, and frequency with which the private events occur (Hayes et al., 2011). The kinds of strategies used encourage the processing of private events that target particular clinical behaviours and contextual factors in order to enhance psychological flexibility. The core processes in the ACT model are linked with basic behavioural principles and through mid-level concepts such as PF, the relationship between behaviours, contextual factors and learning principles are organized and described (Levin & Hayes, 2009). PF can be viewed as the interface for the purpose of organizing theories of psychopathology and well-being and also acts as an assessment tool for organizing and adapting

interventions to match with client characteristics (Waltz & Hayes, 2010). From an ACT perspective, human suffering is derived from normal psychological processes that involve human language and cognition. Many difficult thoughts are believed to be rooted in language where verbally-learned behavioural repertoires and rule-governed behaviour become generalized to many aspects of an individual's life. In other words, the impact of language on thinking and cognition can become problematic through the overuse of generalization in the form of evaluative thinking and problem-solving for example, and this can result in the manifestation of different problems but functionally similar underlying behaviours. According to RFT, verbal behaviour and associated rules are a learned ability that commences in infancy and appears to be a path in which all normal human beings learn how to construct relations among events in their psychological world. However, these normal learning processes also have a dark side in that certain learned rules may have been applicable in certain contexts but not in other contexts, rendering the learned rule inflexible. This phenomenon can easily be seen in overt behaviour but people often use the same rules in the way they process their thoughts too. For example, people are often bound to the rule that unpleasant things should be forgotten but yet they struggle to forget. These processes are further elaborated in Chapter 3 but suffice to know that ACT and RFT are closely intertwined through PF.

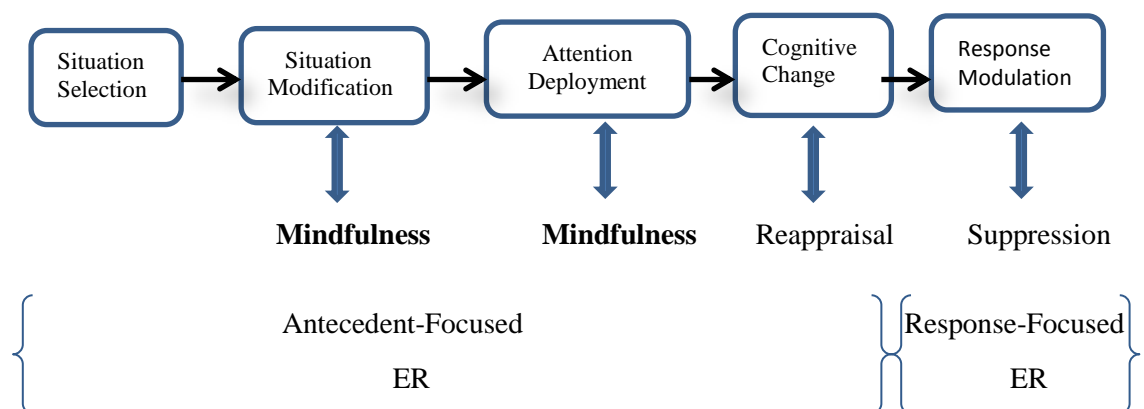
The philosophical and theoretical underpinnings of the PF construct are also consistent with attributes of self-regulation and regulatory flexibility. As a self-regulatory construct, PF has been argued to be an important ingredient for psychological health (Kashdan & Rottenberg, 2010). Psychological flexibility benefits health in several different ways and consequently provides meaning and balance to life. Individuals who are more psychologically flexible have been shown to experience more well-being such as quality of life and life satisfaction while those who are psychologically *inflexible* tend to experience a variety of negative mental health outcomes such as depression and anxiety (Hayes et al., 2006). As a regulatory flexibility construct, an individual with high levels of PF is more likely to respond to the demands of the situation by using the most appropriate strategy while also engaging in the tracking of their

behaviour in order to adjust to the demands of the situation. In other words, higher levels of PF indicate sensitivity towards contextual features which allows for successful behavioural adjustment in the long term. Psychological flexibility is often the result of the use of the most appropriate strategy or response that matches with the situation- based on the goals and values subscribed to by an individual. In contrast, lower levels of PF indicate insensitivity towards contextual features which subsequently results in the use of inappropriate strategies that may only be effective in the short term and is eventually ineffective in the longer term.

The Role of Psychological Flexibility in the Emotion Generation Process Model

As a mindfulness and acceptance construct, PF can be viewed as an attentional deployment regulation strategy that is approach-oriented on one end and avoidance-oriented on the other end of the continuum. Farb and colleagues (2014) have proposed that as an approach-oriented attentional deployment strategy, mindfulness is likely to work differently in the emotion generation process model (Farb, Anderson, Irving, & Segal, 2014). According to the top-down and bottom-up processes, mindfulness can possibly supersede the situation modification stage. A figure of where mindfulness can be situated in the emotion generation process model is presented in Figure 3 adapted from the emotion generation process model in Gross (2002) and Farb and colleagues (2007).

Figure 2.3 Possible locations of mindfulness in the emotion generation process model



Farb and colleagues (2014) proposed that from a mindful response perspective, when stress and emotion occurs, the intention or motivation involved in the experience, is often used as an exploration of the nature of the emotion rather than for solving a problematic emotion. Further along in the emotion generation process, the wider attentional frame serves to create an awareness of bodily sensations as momentary, draws a psychological distance between the broader self and dysphoric feelings, and disrupts the habitual modes of interpretations and reactions, thereby allowing context-centered appraisals. At the appraisal stage, emotions and associated thoughts are experienced as a transitory challenge and an opportunity for insight as opposed to threats or compromises in quality of life. The resulting response then is more of an attitude of curiosity and acceptance rather than increases in sadness or anger or frustration.

In the model proposed by Farb et al. (2014), mindfulness or its antithesis may occur anywhere in the emotion generation process model depending upon the unfolding of emotional processes. Likewise, PF or psychological *inflexibility* is likely to occur anywhere in the emotion generation process. At present, mediational studies that have examined the role of PF in psychological disorders have shown that PF partially or fully mediates the impact of various coping and ER variables in producing psychological distress or symptoms, suggesting that low levels of PF partly contributes to negative outcomes. These studies have demonstrated that as an ER variable, PF is a part of emotional processes but whether PF precedes or is a consequence of the unfolding of emotions is still unknown. A definite conclusion of the role of PF in emotional processing is currently unclear because most of the mediational studies have mainly used a cross-sectional design and therefore a more precise understanding of where PF may be located in the emotion generation process model cannot be determined.

According to prior research on the emotion generation process model, ER predominantly depends on primary and secondary appraisal processes (Lazarus, 1991). Coping and ER responses generally unfold after a situation has been selected. Cognitive reappraisal, an antecedent-focused strategy, has generally been considered a healthier regulatory strategy than expressive suppression, which has been considered a response-focused strategy. But more

recent research suggests that cognitive reappraisal occurs at a later stage in the emotion generation process model while other forms of regulation, such as attentional deployment, potentially occurs before cognitive change (Sheppes et al., 2014). This finding indicates that the use of ER strategies do not seem to depend on them being antecedent-focused or response-focused but rather on the features of the context and on individual predispositions. From the context of the role of PF in the emotion generation process model, PF processes are likely to be employed at any stage in the process model given.

As an approach-oriented attentional deployment strategy, it is likely that PF processes are employed earlier on in the process model. It is often helpful to draw parallels with previous research but very little research has been devoted to attentional deployment strategies. Apart from experimental studies, attentional deployment has been far less examined in comparison to cognitive reappraisal. Few studies that have examined attentional deployment focused on distraction, a strategy that involves avoidant approach when confronted with intense emotional content (Sheppes, 2007). Similarly, depending upon the situation, there is a possibility that PF could occur at an earlier stage in the emotion generation process and psychological *inflexibility* could occur later as a response-focused strategy.

The role of PF processes can further be gauged from neuroscientific research that suggests that responses to emotions can be top-down (activation in prefrontal cortices suggesting cognitive appraisal of stimuli) or bottom-up (activation of limbic cortices suggesting emotional appraisal of stimuli), suggesting that these can be mapped on to the emotion generation process model. For example, antecedent-focused strategies (i.e. reappraisal) are suggested as top-down strategies (i.e. goal-directed) while response-focused strategies are suggested as bottom-up strategies (i.e. stimulus-driven or suppression). But the direct mapping of top-down and bottom-up regulation to reappraisal and suppression strategies is not always straightforward. For example, although high correlations between high levels of trait rumination and activation of amygdala have been observed, the very tendency to ruminate by turning events over and over again in the mind also involves the same cognitive control systems

that is used in reappraisal (Ray et al., 2005). This suggests that ruminators and reappraisers are using the same underlying systems and therefore both may be capable of either strategy. Perhaps the difference in these two strategies is that ruminators may not know when to up-regulate or down-regulate the amygdala.

Similarly, because the PF construct measures two sides of a continuum, it is capable of both generating and regulating emotions. The deployment of attention can either be a top-down process where the focus is placed on a particular stimulus for goal-directed reasons or as a bottom-up process where the focus is stimulus-driven (Taylor & Amir, 2010). Alternatively, just like ruminators and reappraisers above, those who are less psychologically flexible may become stuck in the same cognitive control system and may not know when to up-regulate or down-regulate. And likewise, avoidance in the form of thought suppression can be viewed as a bottom-up process where it is likely that the same habitual/automatic processing is also at play here because the tendency to suppress usually results in the re-emergence of unwanted feelings or thoughts (Wegner & Erber, 1992). Not only does the intended thought re-emerge but all other thoughts that became directly or indirectly related also re-emerge, rendering the attempt to suppress even more impossible (Hooper, Saunders, & McHugh, 2010). Similarly, not only is the target of suppression avoided but any related stimuli is also avoided, rendering suppression attempts more difficult thereby increasing feelings of distress. Moreover, a loss in the ability to discriminate between the to-be-suppressed target and related stimuli can also promote the avoidance of behaviours. The ability for discrimination may actually be beneficial for the individual to become unstuck in this cycle (Hooper, Saunders, & McHugh, 2010). Essentially, the attempt to suppress becomes generalized especially in the context of related thoughts and this can interfere with up-regulation and down-regulation.

The opposite ends of the PF construct continuum can also be viewed as adaptive and maladaptive ER. People who are low in PF use ER strategies such as avoidance, distraction, suppression, and rumination to cope with emotionally-related issues and that eventually leads to maladaptation. Low PF scores also provide an indication of low tolerance for distress, which is

the degree to which an individual is able to endure negative psychological states (Simmons & Gaher, 2005). People who are high in PF are generally more aware and conscious of what they are feeling and thinking and can therefore choose to respond to situations or their internal private experiences with ER strategies that foster adaptation. Moreover, high PF scores indicate a willingness to tolerate difficult psychological states whilst being engaged in value-driven behaviours. Although certain aspects of PF can be said to represent ER strategies, PF also seems to represent a broader construct than adaptive or maladaptive ER. Emotion regulation focuses mainly on the regulation of emotions but PF includes the regulation of other private events that may be linked to emotions such as memories, images, and physical sensations. By definition, ER is concerned with some alteration or modification of the form of emotional experiences (e.g. behaviour, expression, cognitions etc.) or the emotion-eliciting situation and these are also considered as central to PF. But nevertheless, the key difference between PF and other emotion regulation strategies is that PF is a construct that comprises of ER processes rather than specific strategies. An individual with high PF has the ability to assess the situation and behave according to the needs of the context by applying mindful processes. In other words, the PF construct assesses the function of the behaviour in the context in which it occurs. When the purpose of an ER strategy is to avoid, escape from, or reduce the frequency or intensity of emotional experiences, then it can be said that the function of the ER strategy is that which consists of processes in psychological *inflexibility* (Boulanger, Hayes, & Pistorello, 2010). When this method of regulating emotions (i.e. avoidance) becomes overlearned and generalizes across contexts, it can result in disruptions in emotional processing and this in turn can undermine well-being and life satisfaction over the long term.

As demonstrated in the numerous examples above, the PF construct can assume many roles in the emotion generation process model. A clearer picture of the role of PF as a mindful ER variable is required. Moreover, there is a need to explore the association between mindfulness and acceptance and emotions so that a better understanding of their contribution and relevance in mental health problems can be developed and more precise mechanisms of

change can be ascertained for prevention and intervention purposes. Past research has predominantly examined mindfulness and positive and negative affect while examinations of specific relationships between mindfulness and discrete emotions have been neglected. Research in this area is necessary to advance our knowledge of how responding with a mindful approach can contribute to the adaptive nature of specific emotions.

2.1.2.5 Summary and Conclusion: Emotions and Emotion Regulation

The role of emotions in the life of humans is an adaptive one as it allows for readjustments or reorganizations to be made internally with respect to changes taking place in the environment (Gross, 1998; Kopp, 1989). Specific emotions are known to have multi-componential characteristics that differentiate them from one another. These multi-componential characteristics include affect, action tendencies, appraisals, physiology, and neuropsychology. Although emotion components can be identified separately, these components often occur in a synchronized manner when an emotion is experienced. Various theories of discrete emotions support different emotion components (Tomkins, 1954; Ekman, 1994; Izard, 1971; Levenson et al., 1992;) and experimental research is increasingly showing that discrete emotion theories (for e.g. the differential emotions theory proposed by Izard, 1971) either support the patterning of neuropsychological circuits emphasizing physiological and behavioural reactions while appraisal theories of discrete emotions (for e.g. Lazarus, 1968) emphasize cognition and judgment (Lench, Flores, & Bench, 2011). Moreover, each discrete emotion was also found to have unique effects on cognition, behaviour, physiology, and experience, in support of the discrete emotion theories (Lench, Flores, & Bench, 2011).

Discrete emotions can also be distinguished from moods and affect. The distinction between emotions and mood is mainly based on the continuity of action readiness and therefore rigid distinctions between them are not possible. Categorical differences can be observed more clearly between emotions and affect as they have distinct effects on mental health and well-being (Baumeister et al., 2007). Research evidence shows that emotions can be organized as a hierarchical taxonomic scheme where the upper most and middle levels represent two broad

dimensions and the lower or base level represents distinguishable emotional states (Tellegen et al., 1999). Research has also shown that each level in the hierarchical structure has heuristic value wherein more differentiated perspectives with respect to other psychological constructs can be determined. Essentially, differences between the dimensional approaches models and discrete emotion models have largely been ignored. Past research has mainly focused on examining negative and positive affect as two broad constructs while neglecting differences among specific emotions of the same valence. Given that specific emotions of the same valence have different functions, it is likely that the regulation of each specific emotion, irrespective of valence, occurs differently. More recent research is beginning to suggest that specific emotions are important to consider when examining ER as functionality of ER strategies can lead to emotion-specific activation (Zimmerman & Iwanski, 2014). Additionally, the emotion feedback system also suggests that emotional states tend to influence behaviour through ER (Baumeister, 2007).

The emotion feedback system proposed by Baumeister et al. (2007) suggests that when behaviour is aimed at promoting changes in emotional states, then the behavioural consequences are derived from ER instead of from the emotion itself. Therefore, emotions influence behaviour indirectly through the regulation of an elicited emotion or an anticipated emotion. From a linear perspective, emotions trigger its regulation and this in turn triggers behaviours. But since behaviour is aimed at changing emotional states in the emotion feedback loop (Baumeister et al., 2007), it is unclear whether behaviour influences emotions to promote changes in ER or whether the behavioural consequences desired in ER influences emotion. Due to functional differences in specific emotions, the influence of behavioural consequences derived from ER may be different for each emotion. ER strategies are varied but there are some common underlying processes that determine their behavioural consequences.

Many definitions have been proposed for ER as research has shown that people use many kinds of strategies to regulate their emotions. Most ER theorists agree that ER strategies can either contribute to adaptation or maladaptation and can be considered conscious/voluntary

processes or automated processes. Empirical research in ER is increasingly showing that ER processes are transdiagnostic factors underlying many forms of psychological disorders (Aldao & Nolen-Hoeksema, 2010). The effects of maladaptive ER strategies have been found to be more highly associated with psychopathology than adaptive ER strategies (Aldao & Nolen-Hoeksema, 2010). Moreover, deficits in ER skills have predominantly been found to be associated with the emergence and maintenance of psychopathology (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Berking & Wupperman, 2012; Cisler et al., 2010; Gross, 2007).

Presently, our understanding of ER strategies is inconclusive due to the identified gaps in the literature. First, studies examining ER have not focused on the object of regulation, i.e. specific emotions. The majority of ER studies have mainly focused on the dimensional aspect of emotions, i.e. positive and negative affect, or have used measures of distress such as anxiety and depression to represent affect and outcomes. Moreover, the focus of investigation in the majority of studies have been devoted to understanding the role of ER in psychopathology at the expense of attempting to understand the role of specific emotions. Second, the bulk of studies that examined ER strategies have focused on very few strategies (e.g. suppression and rumination) even though a large number of strategies have been identified. This has led to some bias in our understanding of the whole range of strategies that people actually use when an emotion(s) unfolds (Aldao & Nolen-Hoeksema, 2010).

More recently, ER strategies have been organized into ER processes using the emotion generation process model (Webb, Miles, & Sheeran, 2012). The most prominent ER strategies were categorized into three processes, namely, attentional deployment, cognitive change, and response modulation with corresponding ER strategies. Although these processes were found to be conceptually different, the differences among them were modest. Furthermore, it was found that people often use the same strategy in different contexts, thereby suggesting the importance of considering context. Similar findings have been reported in two other meta-analytic studies where people reported using more behavioural avoidant strategies than cognitive strategies (Augustine & Hemenover, 2009) and suppression and rumination strategies (Aldao & Nolen-

Hoeksma, 2010) for regulating emotions. It was also found that people used more maladaptive strategies than adaptive strategies for regulating emotions (Aldao & Nolen-Hoeksma, 2010). Based on the findings from the various meta-analytic findings, it can be concluded that more focus should be given to investigating the person and context as individuals are likely to use a particular strategy in many situations as deemed appropriate or use the same strategy indiscriminately, thereby reducing effective regulatory behaviour.

Regulatory flexibility has been proposed as an emotional self-regulatory construct that includes processes such as context sensitivity, repertoire of wide-ranging strategies that meet contextual demands, and ongoing monitoring of ER behaviours. These processes are thought to underlie a range of adaptive strategies while deficiencies in these processes underlie a range of maladaptive ER strategies. The interrelated combination of processes in the regulatory flexibility construct varies according to the stressor and is a dynamic multidimensional construct that responds to shifting contextual demands. The ability to use the most appropriate strategy in a given situation also depends upon attentional awareness. Attentional awareness is instrumental in emotional processing and has been studied extensively in emotional awareness and mindfulness. While emotional awareness has greatly contributed to our understanding of the importance of describing and experiencing emotions in ER, some shortcomings lie in the myriad of measurements available that essentially tap into distinct static characteristics of emotional awareness. In this respect, mindfulness measurements appear to be more uniform as they measure similar mindfulness processes and behaviours. Additionally, the training of attention in mindfulness has demonstrated that it is an effective therapeutic modality for psychological problems.

Mindfulness and acceptance has been demonstrated as processes underlying ER strategies that utilize attentional awareness at its core. Cognitive neuroscientific research suggests that neural correlates of mindfulness and cognitive ER strategies are similar with the only difference being in the way neural activation is managed. Mindfulness and acceptance promotes effective self-regulation through increased regulatory flexibility. The

multidimensional benefits of mindfulness generally support behavioural control (i.e. the ability to inhibit impulsive behaviours) instead of emotional control (i.e. avoidance and/or suppression of the intensity, frequency, and duration of unwanted emotions; Gratz & Tull, 2010). When emotional control dominates, then avoidance and overengagement strategies are used for regulating emotions and an individual can become stuck in the cycle of the emotional control agenda. Regulation through emotional control contrasts with being in a mindful and accepting state as intolerance for negative affect and the use of habitual reactions incrementally increases. Aspects of both mindfulness and acceptance and emotion dysregulation are captured by the PF construct. PF has been described as a mindful ER construct that represents mindfulness and acceptance processes on one end of the continuum and on the other end, psychological *inflexibility* represents rigidity in managing emotions.

Based on the proposition of Farb and Irving (2007), mindfulness is likely to occur earlier in the emotion generation process model where it is expected to influence appraisal processes and act as an attentional deployment process. Similarly, PF or psychological *inflexibility* is likely to occur earlier in the emotion generation process model. One way to test these assumptions is to understand the temporal relationship between PF and specific emotions. Recent research suggests that ER can develop in an emotion-specific manner (Zimmermann & Iwanski, 2014). This is also in line with the developmental perspective that as a specific emotion and corresponding behaviours develop over time, additional behaviours that add on to the repertoire support the existing function of the emotion (Izard & Ackerman, 2000). Therefore it is more prudent to test this relationship by using specific emotions. The aim of the proposed study is to address some of the gaps in the literature in relation to specific emotions and PF in order to advance our knowledge of the role of mindfulness and acceptance in the emotion generation process model by using a longitudinal research design. Because specific emotions are appraisals of the encountered situation, the cross-lagged longitudinal design can provide information as to whether PF processes influence appraisal processes earlier in the process model or after appraisals are made. Knowledge about the temporal relationship

between PF and each specific emotion is likely to provide some clarity about the role of mindfulness and acceptance processes in the emotion generation process model.

2.2 Emotion Regulation and Perceived Social Support

2.2.1 Definition and the Interpersonal Model of Emotion Regulation

The notion that ER is an intrapersonal and interpersonal concept is gaining attention among researchers (Campos, Walle, Dahl, & Main, 2011; Hofmann, 2014; Marroquin, 2011). As an intrapersonal concept, the focus is on ER processes that occur inside the individual. In other words, individuals cope with or regulate emotions by processing them internally by avoiding thoughts, images, memories, physiological sensations etc. associated with the experience of emotions. According to the interpersonal view, human beings are embedded in a social context and therefore the goal of ER is also social in nature. An interpersonal view of ER involves people, situations, and external triggers. Interpersonal interactions can provoke powerful emotions, such as joy, anger, shame, jealousy etc., and the regulation of these emotions cannot be readily explained only from an intrapersonal perspective. Emotions are partly regulated and expressed within a social context in which others play a role (Hofmann, 2014). Also, negative emotions are not just down-regulated in the service of up-regulating positive ones but they are also regulated in the service of attaining socially-related goals. Campos and colleagues provide a definition for the social embeddedness of ER as follows:

Emotion regulation is typically a process of negotiating or coordinating the various goals and strivings of an individual who is in a relational encounter with another individual or groups of individuals with sometimes similar but often quite different goals and strivings to that of the individual (Campos et al., 2011, p. 27).

It has also been suggested that the development of ER occurs within a social context. For example, in the context of parent-child interactions, adaptive and maladaptive emotion development occurs via ongoing interactions and corresponding attentional deployment (Crockenberg & Leerkes, 2004; Ruff & Rothbart, 1996). The external environment in the form

of caregiver's reactions or non-reactions and expressions/discussions about emotions provide key input and feedback for emotional development in children and adolescents (Eisenberg, Spinrad, & Eggum, 2010; Posner & Rothbart, 2000). With the development of executive functioning and the advent of higher cognitive abilities, ER becomes more conscious and intentional (Derryberry & Rothbart, 1997; Eisenberg & Morris, 2002).

Marroquin (2011) has provided an account of interpersonal influences on ER in depression based on interpersonal dysfunction as a core phenomenon. In light of interpersonal influences on ER, Marroquin (2011) proposed that social support potentially plays a role in intrapersonal ER. Social support is viewed as an interpersonal coping style that involves the recruitment of social resources in times of need through existing social support networks. Building on this understanding of social support, intrapersonal ER processes can be modulated in interpersonal interactions. For example, attentional bias towards negative content when an individual is depressed can be redirected by supportive others. Supportive others also have the potential to provide alternative interpretations and perspectives on situations that may lead to more flexibility in thinking. The effects of social support are also largely dependent upon relationship-interaction specific factors such as the credibility of the support provider (Lakey & Orehek, 2011). Relationship-interaction specific factors potentially influence attempts by support providers to broaden the range of information and increase cognitive flexibility of the support recipient. Support providers often use attentional deployment and cognitive re-evaluation processes broaden interpretations and perspectives of the support recipient. Although researchers (Hammen, 1991; Joiner, Metalsky, Katz, & Beach, 1999) acknowledge that ER in depression and other mental health disorders occurs within a social context, processes that influence social interactions are still unclear. This is possibly due to the involvement of many actors in the social network. For example, the perception that social support will be available when needed depends on past experiences of social interactions along with characteristics of the support recipient, the support provider, and the relationship between them (B. Sarason, Pierce, Bannerman, & Sarason, 1993). Over the years, the effects of social support

on mental health have produced conflicting findings. Past research has shown that social support has enhanced coping capabilities while also contributing to negative coping (Folkman & Moskowitz, 2004). This is possibly due to the many ways in which the social support construct has been defined and also due to an unclear understanding of how social support processes interact with intrapersonal processes.

The social support construct has been examined and operationalized from several perspectives by different researchers. This has led to different ways of understanding different aspects of social support. An important aspect of social support is that it consists of two main features namely, social support network size and social support functions. Cohen (2004) defines social support as “a social network’s provision of psychological and material resources intended to benefit an individual’s ability to cope with stress” (p. 676). Social support network size provides an indication of social integration (i.e., participation in social relationships; Brissette, Cohen, & Seeman, 2000). Social support functions are reflected in the social resources provided by those in the social support network which include emotional support (e.g. concern, empathy, affection), informational support (e.g. guidance for problem-solving), financial support, and instrumental support (e.g. assistance in tasks) (Reevy & Maslach, 2001). Measures of social support are either subjective (i.e. perceived social support, PSS) or objective (i.e. received social support, RSS) and include both social support network size and satisfaction with social support. PSS is the perception that social support will be available when it is needed (Lakey et al., 2002) whereas RSS is the actual support received (Uchino, 2009). Research evidence suggests that PSS and RSS are associated but they are different components of the broad social support construct. Correlations between PSS and RSS are modest and they are also differentially related to depression.

Although social support can be viewed as a multidimensional concept, the Social Support Questionnaire (SSQ; Sarason, Sarason, 1983) measures some important aspects of social support. Perceived social support is a reflection of a stable psychosocial environmental factor in comparison to enacted support which represents actual provisions of social support and

is closely linked with social and contextual factors. Investigations of enacted support and mental health have either yielded no effects or harmful effects on mental health (Barrera, 1986; Bisschop, Kriegsman, Beekman, & Deeg, 2004; Gleason, Iida, Shrout, & Bolger, 2008; Helgeson, 1993). In this respect, PSS has been shown to be a better predictor of recovery and recurrence of depressive episodes than enacted support in adolescents with underlying neurobiological vulnerability (Rao, Hammen, & Poland, 2010). According to Marroquin (2011), intrapersonal ER is influenced hierarchically by PSS and RSS. The level of social integration and perceived satisfaction with social support at the PSS level influences RSS. At the RSS level, interpersonal influences on attentional deployment and cognitive re-evaluation processes are thought to influence intrapersonal attentional deployment and cognitive re-evaluation processes or intrapersonal ER. This hierarchical view of the influence of social support on intrapersonal ER is based on the notion that the cumulative effects of social interactions and social relationships may be plausible antecedents of intrapersonal ER. For example, the finding that adolescents, in particular, regulated the expression of sadness and anger according to intended social norms (i.e. suppression of sadness and display of anger), can also have an alternative interpretation (Zeman & Shipman, 1998). The intrapersonal regulation of emotions- that is, the decision to suppress or express either emotion in this study, can be interpreted as a *consequence* (emphasis added) of past social interactions and relationship-specific factors rather than an intention to achieve a social goal that can have an effect on future social interactions and relationships. Based on the two possible interpretations, PSS and RSS can either be an antecedent or a consequence of intrapersonal ER. The directional relationship between social support and intrapersonal ER is still unknown but previous research provides some clues as to the possible directional relationship of interpersonal ER and intrapersonal ER. Although it is acknowledged that RSS is important, the focus of this research is on PSS.

2.2.2 Research in Perceived Social Support

Past research has shown that PSS is important in maintaining both physical and mental health (Cohen, Gottlieb, & Underwood, 2000). Low PSS is particularly implicated in

depression (Cornwell, 2003). PSS is also considered an important means of coping with daily hassles and major life events as it facilitates adaptive coping (DeLongis & Holtzman, 2005; Thoits, 1986). Deficits in social functioning have been well documented as a correlate of depressive rumination in a large body of research (Grassia & Gibb, 2008; Nolen-Hoeksema et al., 2008; Watkins, 2008) and research evidence has shown that social support acts a buffer against depressive rumination (Nolen-Hoeksema & Davis, 1999; Puterman, DeLongis, & Pomaki, 2010). Moreover, the beneficial influence of PSS is experienced more when supportive others perceive coping behaviour of the support recipient to be appropriate in comparison to those who display less appropriate behaviour (Siewert, Kubiak, Jonas, & Weber, 2013; Silver, Wortman, & Crofton, 1990; Vollmann, Renner, & Weber, 2007). Although the association between PSS and emotional well-being is well established, most of these studies are cross-sectional and correlational in nature. It is still unclear as to how PSS and intrapersonal ER influence each other. In an attempt to clarify the relationship between PSS and intrapersonal ER, other researchers have investigated PSS as a moderator and mediator.

In the broader social support literature, it has been found that PSS can have a protective effect (moderating effect) during stressful situations (Cobb, 1976; Cohen & Wills, 1985) or PSS can independently have a direct effect on coping regardless of stress levels (Compas, Wagner, Slavin, & Vannatta, 1986). In addition, social support has also been proposed to play a mediating role between stressors and ill-health in which the interaction between PSS and stress levels influence the level of symptoms experienced (Yarcheski & Mahon, 1999). All three models (i.e. PSS as a moderator, an independent influence, and as a mediator) were tested in early adolescents. The findings indicated that among early adolescents, PSS was a mediator of the stress-outcome relationship rather than a moderator. Additionally, PSS was strongly inversely associated with the pattern of negative symptoms suggesting that PSS potentially has a direct effect on symptoms (Yarcheski & Mahon, 1999).

Other researchers attempted to explore the mediating role of PSS in the relationship between emotional competencies and help seeking behaviours in adolescents (Ciarrochi, Deane,

Wilson, & Rickwood, 2002; Ciarrochi, Wilson, Deane, & Rickwood, 2003). Emotional competencies consisted of three separate measures. The self-report emotional competence inventory (Schutte et al., 1998) measures the ability to perceive emotional cues, the management of self-relevant emotions, and the management of others' emotions. The levels of awareness scale (LEAS; Lane, Quinlan, Schwartz, Walker, & et al., 1990) measures levels of emotional awareness and the Toronto Alexithymia Scale (TAS-20; Bagby, Parker, & Taylor, 1994) measures the ability to identify and describe emotions. The three measures were used in the first study but only the self-report emotional competence inventory and the TAS were used in the second study. Measures of emotional competencies used in these studies were considered aspects of intrapersonal ER. In the first study, adolescents with low emotional competence were least likely to seek nonprofessional help but were more likely to seek professional help (Ciarrochi et al., 2002). Moreover, the link between emotional competence and help-seeking behaviour was partially explained by PSS. In the second study, the same results were replicated. Adolescents with low emotional competence were also unlikely to seek help from nonprofessional sources (Ciarrochi et al., 2003). Developmental differences between younger and older adolescents were analysed in the second study. Younger adolescents (aged 13) with difficulties in identifying and describing emotions tended to have higher intentions of seeking help from nonprofessional and professional sources while the reverse pattern was observed in older adolescents (aged 14-15). Similar to the first study, PSS partially mediated the relationship between emotional competence and help-seeking intentions (Ciarrochi et al., 2003). The results suggested that when adolescents reported feeling distressed even with reported high levels of PSS, the intention to solicit help was low and that emotional competencies were still important in explaining help seeking behaviour. These studies provided some preliminary clarification for the relationship between intrapersonal ER and interpersonal ER and raised the possibility that intrapersonal ER may also influence social support in older adolescents.

The literature reviewed above indicates that the relationship between interpersonal ER and intrapersonal ER could operate in either direction. It remains unclear whether interpersonal

ER is an antecedent of intrapersonal ER as proposed by Marroquin (2011) or vice versa. The central argument presented by Campos and colleagues is that there is a need to differentiate between intrapersonal and interpersonal ER. They believe that the purpose of selecting, modifying, or expressing a particular response is often neglected in research studies (Campos et al., 2011). In other words, the social context is deemed as primary for processing intrapersonal ER. The studies conducted by Ciarrochi and colleagues seem to suggest that intrapersonal ER in mid- adolescence may be a precursor of interpersonal ER. The purpose of the current study was to address this gap in the literature.

According to the definition of intrapersonal ER, individuals regulate or process information internally. Borrowing from the description of PF processes in the ER section above, PF can be viewed as an intrapersonal ER variable as these processes are intrinsic in nature. Additionally, PF processes are involved attentional deployment and which occurs within an individual. High levels of PF represent mindfulness and acceptance processes and are concerned with awareness and observation while low levels of PF can be said to measure aspects of intrapersonal ER that is broadly concerned with avoidance of internal experiences. It has been suggested that those who are low in PF will most likely avoid social interactions because negative evaluations are likely to dominate attentional processes (Boulanger et al., 2010). On the other hand, high PSS is associated with higher levels of mental and physical health. In theory, those who are high in PF will tend to be high in PSS as well but whether being high in PF is a prerequisite for being high in PSS or whether high PSS is a prerequisite for high PF is still unclear. In other words, it is unclear whether people who are generally more mindful and accepting will perceive themselves as more satisfied with their social network or report having larger social support networks or vice versa. The directional relationship between PF and PSS is considered important for informing prevention and intervention efforts. The determining of antecedents is of primary importance as this allows problems to be addressed at their roots. If PF is an antecedent of PSS, then prevention programs can address the willingness to experience internal distress which can potentially have an effect on the willingness to seek

support when it is needed. If PSS is an antecedent of PF, then adolescents may be given some training in social skills so that they may be encouraged to engage with their social supports. Regular interactions with their social supports may help adolescents understand and become more engaged in intrapersonal regulation of emotions.

2.2.3 Summary and Conclusion: Emotion Regulation and Perceived Social Support

The distinction between intrapersonal and interpersonal ER and the relationship between the two variables is gaining attention among researchers. Researchers are suggesting that the role of others is an important aspect of intrapersonal regulation (Campos et al., 2011; Hofmann, 2014; Marroquin, 2011). Social support has been suggested as a representative variable for interpersonal ER (Marroquin, 2011). PSS and RSS have been proposed to have a hierarchical influence on intrapersonal ER. Both PSS and RSS have been found to be important indicators of well-being but PSS is the focus of this research. The relationship between intrapersonal ER and PSS has mainly been explored in cross-sectional studies. Evidence from previous studies has shown that intrapersonal ER may be more important than PSS in predicting help seeking behaviour (Ciarrochi et al., 2002; Ciarrochi et al., 2003).

The intention of the proposed study is to address some gaps in the literature in relation to intrapersonal ER and interpersonal ER by using a longitudinal research design. Psychological flexibility has been proposed to be an emotion regulation strategy that represents intrapersonal ER. The relationship between PF and PSS is explored to gain a clearer directional picture of the relationship between intrapersonal (via PF) and interpersonal emotion regulation (via PSS) as this knowledge has the potential to support efforts in therapeutic settings.

Chapter 3: Psychological Flexibility

The foundations of the early years are thought to account for individual differences in the experience and regulation of emotions later in life. Various experimental observations suggest that emotional awareness and understanding, knowledge of emotional causes and consequences, and the regulation of emotional expression are all learned in the early years and continue to become more distinct as language and cognition develop in the later years (Meerum Terwogt & Stegge, 2001). Likewise, experimental studies have shown that PF develops in the early years (Lipkens, Hayes, & Hayes, 1993; Roche, Barnes-Holmes, Smeets, Barnes-Holmes, & McGeady, 2000). PF is likely to be learned through emotion socialization in the family (Eisenberg, Cumberland, & Spinrad, 1998). For example, negative parental responses to emotional experiences in childhood have been shown to result in avoidant coping responses and psychological symptoms in those children (Eisenberg, Fabes, & Murphy, 1996). In the same way, parental/caregiver PF levels and their interpersonal interactions with their children contribute to high or low PF in children (Coyne & Thompson, 2011; Coyne & Wilson, 2004; Williams, Ciarrochi, & Heaven, 2012). The evidence above suggests that the formation and shaping of PF tendencies, emotional experiences, and interpersonal processes commences in childhood.

3.1 Defining Psychological Flexibility

3.1.1 Definition

PF refers to the willingness and openness to experience difficult and unwanted internal events including thoughts, feelings, emotions, physical sensations, and memories without being overly entangled with them (Hayes et al., 2006). The main tenet of PF is that when people are low in PF, they are overly entangled with their thoughts and are unable to notice the transitory thinking process itself and therefore rely excessively on avoiding/escaping negatively evaluated private events. Those high in PF manage their responses and behaviour with an active awareness of their thoughts and emotions in the present moment and conduct themselves

according to the demands of the situation. People who are open and flexible are able to rearrange their mental resources, make shifts in their perspectives, and develop a balance between wants and needs in order to move towards identified goals and values (Kashdan & Rottenberg, 2010). On the other end of the continuum, people who are low in PF have been found to have various psychopathological symptoms (Boulanger et al., 2010). People who are *inflexible* have rigid thought patterns and this can be observed in those who ruminate and worry and in behavioural patterns that produce ineffectiveness. Additionally, they are unable to rebound after a stressful event and are incapable of planning and working towards distant goals (Kashdan & Rottenberg, 2010).

Although the PF model ACT is represented by the six core processes, the PF measurement predominantly highlights experiential avoidance and cognitive fusion which represents a state of psychological *inflexibility* (emphasis added). Experiential avoidance and cognitive fusion are viewed as processes that undermine the use of flexible attentional processes, a workable view of self that contains self-knowledge for the regulation of psychological difficulties, and actions/behaviours that moves one towards chosen values. A more detailed explanation of experiential avoidance and cognitive fusion are provided below.

Cognitive fusion and experiential avoidance are unhealthy processes that interfere with more adaptive self-regulatory behaviour and are relevant in the development and maintenance of psychological disorders (Boulanger et al., 2010; Hayes et al., 2006; Ruiz, 2010). Cognitive fusion is the belief and treatment of verbal and cognitive events as literal truths; thus altering their functions (Levin & Hayes, 2009). Verbal processes eventually dominate behavioural repertoires of the individual to the extent that they become rules that narrow an individual's responses and make them insensitive to the immediate context. Ultimately, the individual loses contact with the results of direct experiences (Y. Barnes-Holmes, Barnes-Holmes, McHugh, & Hayes, 2004). As a result, the individual gets entangled with the content of these private events and perceives them as reality instead of as transitory events (Luoma & Hayes, 2009). Consequently, an attempt to avoid the content of private events becomes a relentless effort in

trying to alter or control the intensity, frequency, or form of private events that result in experiential avoidance (Greco, Baer, & Lambert, 2008). The avoidance of negative emotions or other private events may not necessarily be maladaptive when there is a willingness to experience them internally or when there is an acknowledgement of their presence (Boulanger et al., 2010). But when there is an unwillingness to experience private events, they come under aversive control because repeated attempts are made to avoid or suppress them. Essentially, private events are there whether one is willing or not willing to have them. Instead of just allowing or accepting their presence, individuals who attempt to control or suppress emotions and associated private events are considered to be high in experiential avoidance. Moreover, the paradoxical effects of suppression show up in the form of rebounding effects and the object of suppression become ever more present in the periphery of attention (Wegner, 1994). As a result, the frequency and intensity of private events increases as attempts to avoid or suppress them increases.

On one end of the PF continuum, these processes consist of psychological *inflexibility*, characterised by experiential avoidance and cognitive fusion and that forms the cognitive behavioural aspect of the model. At the other end, psychological flexibility is characterised by mindfulness and acceptance processes. For the purpose of this thesis, the endpoints of the psychological flexibility continuum will be referred to as high PF and low PF.

3.1.2 Underlying Philosophy and Theory

3.1.2.1 Functional Contextualism

The underlying philosophy of the PF construct is based on the worldview of science called functional contextualism (Hayes, Blackledge, & Barnes-Holmes, 2001). The philosophical assumptions of functional contextualism are based on “the whole organism interacting in and with a historical and situational context” (Hayes, 1993, p. 24). Functional contextualism provides an approach for observing all behaviours so that principles, theories, and methodologies can be derived for the successful prediction and influence of behaviour (Biglan & Hayes, 1996). In addition, a holistic account of behaviour can only be complete when the

historical and situational context is also considered. Context refers to both the current and immediate situation/environment in which the event occurs and an individual's learning history. Features in the context include the physical, social, biological, and/or cultural aspects. The focus on behaviour in context is paramount in understanding the function of the behaviour because individual context provides a basis for exploring the learning history and the current contingencies that govern behaviour for the purpose of manipulating/influencing the same behaviour. It has been argued that models of therapy remain incomplete when the context is not considered. They may be useful in predicting thought-action, emotion-action, or behaviour-behaviour relationships, but they lack a means to explain the influence variables outside the psychological event (Biglan & Hayes, 1996; Hayes & Brownstein, 1986). Philosophical assumptions of functional contextualism provide the foundation in the scientific and of what is now called Contextual Behavioural Science (CBS). Contextual Behavioural Science has Relational Frame Theory (RFT) as its primary theoretical foundation.

3.1.2.2 Relational Frame Theory

Behavioural principles underlying the PF construct are derived from the theoretical foundations of Relational Frame Theory (RFT; Hayes, Barnes-Holmes, & Roche, 2001). RFT is an advanced behavioural theory of language and cognition that provides a refined approach to account for how people use language and cognition, consciously or unconsciously, to produce relationships between thinking, emotions, behaviours, physical sensations, and other private events. The derived relations abstracted from these relationships between private events can be arbitrarily derived and have the ability to transform the function of those relationships by virtue of stimulus equivalence (Hayes, Fox, et al., 2001). Over time, the abstracted relationships between private events become more firmly learned (i.e. the type of relating and transformation of functions) as they are reinforced by the social verbal community (Barnes-Holmes, Hayes, Dymond, & O'Hora, 2001). The social verbal community can be referred to as a type of psychological influence through terms or expressions that are commonly used in everyday language and that represent the norms and values of a wider social system (Burton & Kagan,

1994). Basic experimental research studies indicate that each derived relation is a generalized operant and the ability for relational responding commences approximately at the age of two, develops over time from training in deriving relations and through repetitive contact, and can come under the control of antecedents or consequences (Healy, Barnes-Holmes, & Smeets, 2000; Lipkens et al., 1993; Roche et al., 2000)

RFT posits that verbal behaviour is a kind of action that occurs at the cognitive level, and events are framed relationally through a history of operant conditioning in multiple exemplars. As consequences (through the property of a stimulus or stimuli) start to control responses or behaviours (results of the way we think and act), they start generalizing across situations and contexts without due regard to differences between each situational context (Berens & Hayes, 2007). Examples of a property of a stimulus are described along broad relational themes such as differential relations, spatial relations, temporal relations, causal relations, and perspective-taking relations (Hayes, Fox, et al., 2001). For example, comparative relations draw on distinctions such as before and after, more than and less than, smaller than and larger than, and similar other ones (D. Barnes-Holmes et al., 2001). A number of studies have shown that such properties of a stimulus can influence an individual's response or behaviour in an arbitrary manner and can lead to the formation of rules (Berens & Hayes, 2007; Dougher, Hamilton, Fink, & Harrington, 2007). Such rules can develop in strength to become automatic responses coupled with the inability to discriminate between contexts. Rule-governed behaviour is necessary for the functioning of civil society, however, in private, rule-governed behaviour can lead to psychological problems because just about anything can be related to anything by virtue of relational framing (Torneke, 2010).

The utility of the basic research in RFT is that it has been seamlessly used in ACT as it accounts for an analysis of verbal behaviour that can be influenced beyond the limitations of the therapy environment. Basic research has demonstrated that various types of relational responses that reflect derived transformations of functions were seen in avoidant responses (Dymond, Roche, Forsyth, Whelan, & Rhoden, 2007), sexual arousal, (Roche et al., 2000), and self-

discrimination (Dymond & Barnes, 1995). The relational nature of language is well-known; however, responses derived from the transformation of functions of a stimulus are what have prompted the direct application of this principle in clinical settings. In ordinary daily life, these verbal processes are essential for dealing with survival and evolutionary activities in the form of problem-solving, but the same verbal processes can also result in transforming functions that are unwanted and that keep us stuck in a repetitive psychological cycle. The implications drawn from RFT principles for application in clinical settings are that cognitions cannot be eliminated because an individual's history cannot be subtracted and so by default, learning has an additive nature. Second, because learning is a process in which only more can be added, direct attempts to change or alter cognitions simply add on to the relational network. As relational cues potentially become functional cues, the importance and centrality of those problematic cognitions are actually increased rather than diminished (Levin & Hayes, 2009). Finally, the relational network carries all the relational and functional cues which are under the influence of an individual's past history and immediate context (also called contextual control). So rather than manipulating the cognitions (e.g. form, content, or frequency of thoughts) to reduce the effects of the harmful functions, the relevant context can be manipulated instead to transform the way one relates to thoughts and emotions (Hayes et al., 2006). The relevant context can be manipulated by influencing antecedents or by influencing consequences (Torneke, 2010).

The PF construct emerged from RFT principles and represents a model of well-being and psychopathology. The PF construct can be used for assessing patterns of behaviour that can become pervasive and can therefore be used to guide targeted intervention programs. PF is the unifying construct that brings together RFT principles and the ACT agenda of maintaining psychological health and functioning. An RFT conceptualization of the PF construct is presented below.

RFT Conceptualization of PF

The RFT/ACT explanation for psychopathology assumes that a part of being human involves the experience of pain, loss, and traumas. However, human experiences become a

source of suffering when language processes interact with direct contingencies to create a singular focus on minimizing or managing painful experiences that are unhelpful and obstructs engagement in behaviours that lead to valued actions. The relentless pursuit to minimize painful experiences culminates in to psychological *inflexibility* as it is a result of a weak and unproductive control of contextual cues. According to RFT, the ineffective control of contextual cues can also be referred to as ineffective rule-governed behaviour. PF can be understood as rule-governed behaviour that is explained by verbal processes described in RFT. Some basic assumptions of RFT need to be presented in order to highlight some of its relevant aspects for rule-governed behaviour and psychopathology.

As mentioned above, in the normal development of language in humans, people learn how to relate stimuli and as more vocabulary is added, the ability to relate stimuli becomes more arbitrary and soon develops into a generalized operant response (Healy, Barnes-Holmes, & Smeets, 2000). As language develops and becomes more complex through implicit and explicit training (multiple exemplar training), people learn to use contextual cues (e.g. same as opposite of, more than, better than, part of etc.) for relating and abstracting meaning to arbitrarily apply to new stimuli. What this means is that a child will eventually learn how to apply or transfer the meaning of one stimulus to another stimulus that share no formal properties and without actually having learned this before. This transfer of meaning is called functional cues and the choice of which function is transferred depends upon what is promoted in the social context (Hayes et al., 2001). The main result of this ability is that the arbitrarily established relations actually alter the function or meaning of the stimulus. For example, an arbitrary stimulus A is equivalent to an arbitrary stimulus B, and B is equal to a third arbitrary stimulus C. After a while, A is equal to C just through a mere transference of relation that B is equal to both A and C. Similarly, if A was said to be tall, then through the same transference of equal relation, B and C would also be considered tall without having any previous direct contact with B and C. The moving around of stimulus functions is called relational framing and the different relations among stimuli are called relational frames. Relational frames represents

patterns of relations that are derived through relational framing/ responding and for this, relational cues could come from frames of coordination, comparison, distinction, opposition, or hierarchy (see Hayes et al., 2001 for more details). As soon as a child learns the basics of relational operants, they then start framing any stimuli relationally according to the reinforcement provided in their environment. As development occurs, more complex relational frames are established until the child can derive rules for himself or herself. Although the ability for relational framing is an important developmental marker of cognitive abilities, there is another side to this ability.

The ability for moving relations around among stimuli in relational networks and the functions that may get transformed from derived relations in addition to ones that are derived through equivalence may help explain aspects of psychopathology. Many problems can emerge from deficits in relational framing, through arbitrarily derived relations, and through the following of rules (Villatte, Villatte, & Hayes, 2016). Deficits in relational framing have been shown to correlate with deficits in cognitive and social abilities in children, in particular, deficits in reasoning, problem-solving skills, theory of mind, perspective taking, and empathy (Barnes-Holmes, McHugh, Barnes-Holmes, 2004; Kishita, Ohtsuki, & Stewart, 2013; Lipkens & Hayes, 2009; O'Hara, Pelaez, Barnes-Holmes, & Amesty, 2005). Conversely, training in relational skills has been shown to improve IQ from an average of 12 to 15 points in normal children and children with intellectual disabilities (Cassidy, Roche, & Hayes, 2011). Deficits in relational skills therefore indicate the inability for effective problem solving, the failure of logic, and/or inability to generate alternative solutions when challenges arise. These deficits along with cognitive biases are often seen in those with psychological difficulties.

Furthermore, the presence of relational skills can also be psychologically challenging. The ability for derived relational responding can be arbitrary where not only are the formal properties of related events linked but also non-formal properties are linked with any set of relations in the presence of relational cues. In other words, training in relational frames usually progresses from non-arbitrary to arbitrary stimuli (see Torneke, Luciano, & Valdiva, 2008 for

more details). By virtue of arbitrarily derived relational responding, anything can be related to anything. Further, within these relations, the function of one relata can alter the function of another relata. For example, remembering one painful memory in the past can alter the experience of the situation in the present. Hearing a word such as relax can remind the person of a previous panic attack and eventually elicit a panic attack. Arbitrarily derived relational responses can also be viewed as symbols where all emotional, cognitive, perceptual, or motivational symbols of an object or an event can be remembered or felt within an instant just by thinking or speaking about it and without coming into direct contact with it. Very naturally, people will start avoiding any symbolic stimuli that has acquired the function of emotional pain or sensations. Eventually, avoidance restricts people from engaging in a range of possible behaviours when the symbolic stimuli are present. In conclusion, although derived relational skills are necessary for cognitive development, they may have disadvantages. Disadvantages of derived relational skills can more clearly be seen with the application of rules that have become problematic.

Rule-governed behaviour was used by Skinner (1966) to explain complex human behaviour but its applicability in some instances was problematic (see Torneke, Luciano, & Salas, 2008 for an elaborate explanation). In the past few decades, a large body of accumulated experimental research in RFT has shed light on how rule-governed behaviour (see Hayes, 1989) actually works through stimulus equivalence (see Sidman, 1994). According to Skinner (1966), a rule actually works as an antecedent, functions as a contingency and therefore controls behaviour. Rules can be explicit or implicit rules given by others (social verbal community), given to ourselves (self-rules or implicit rules), or self-directed (rules generated to maintain a conceptualized self; see Y. Barnes-Holmes, Barnes-Holmes, McHugh, & Hayes, 2004 for details). Rules work like a contingency-shaped operant and include antecedents, behaviours, and consequences. A contingency-shaped behaviour is the result of a direct experience where the shaping of a behaviour occurred contingent upon a consequence. The behaviour concurrently displayed may have been derived from the individual's past history of

contingency-shaped behaviour. Subsequently, rules influence behaviour through relational frames of coordination as they alter the function of properties as in arbitrarily derived relational responding. In RFT terms, “rules may be defined as examples of relational networks and transformations of function that are more or less complex” (Y. Barnes-Holmes et al., 2004, p. 365). Rules can be characterized by three different kinds of reinforcement history: pliance, tracking, and augmenting.

Pliance can be considered behaviour that is under the control of speaker-mediated consequences. For example, an individual responds to someone in order to obtain their favour. A behavioural response due to pliance is usually dependent upon social consequences. Once pliance is reasonably established, then an individual is capable of tracking. Tracking is behaviour under the control of the correspondence between the way the world is arranged and the rule and is therefore independent of social consequences. Augmenting is unlike pliance and tracking as it does not rely on specific consequences or contingencies but rather changes or augments the reinforcing value of the specific consequences in the rule. Augmentals do not only exert control over consequences that are directly contacted but also over abstract consequences that have not been directly experienced. In this way, augmentals promote flexibility by opening up the possibility for delayed responding as behavioural consequences can be contacted in the distant future and can be extremely abstract.

All three characteristics of rules are necessary elements for appropriate behavioural and cognitive functioning but they can become problematic when rule-following results in insensitivity to the context at hand. The advantage of delayed responding in rule-following can become a disadvantage when contact with direct contingencies is not considered any more. Rules can be followed blindly without taking into consideration the possibility that changes may have occurred in the same situation. Experimental studies have shown that rule-following can become a hindrance when adjustment to a new or changed situation is required (Hayes, Brownstein, Zettle, Rosenbarb, & Korn, 1986; Matthews, Shimoff, Catania, & Sagvolden, 1977). From an RFT perspective, rule-governed behaviour participates in psychopathology by

overriding direct contingencies and contributes to rigid behavioural repertoires. Psychological problems resulting from rule-following can be seen when augmenting interacts with pliance and tracking to alter the functions of direct contingencies.

The main problem with pliance is when a person is primarily driven by socially-mediated consequences. Consequently, they are likely to have problems contacting other reinforcers. Socially-mediated consequences are not in one's control as "other's" play the role of providing reinforcement, which can be highly unpredictable. A person is most likely to experience multiple rejections because the contingencies are controlled by others. In this way, sensitivity towards consequences provided by others increases and sensitivity towards direct consequences is prevented. The consequence of problematic pliance also hinders tracking as direct consequences are not contacted. Problems with tracking occur when the track does not match with the specified consequence. Over time, the tracking of behaviour is abandoned because desired consequences are not contacted. A good example of inaccurate tracking can be seen in addictive behaviours where short term and long term consequences are not coordinated. The person will track the short-term consequence of reducing pain through alcohol or drugs and not track the long term destructive consequences. Tracking in the short term will not be effective for the long term as tracking strengthens in the short term through continued drinking but the problems will not go away in the long term. The same principle can be applied to anxiety and depression. The reason why people stick to pursuing certain rules is due to problematic augmenting.

Interaction between augmenting and pliance contributes to the perpetuation and extension of pliance. Although people feel the need to obtain approval from others to obtain more concrete forms of reinforcement, generalized pliance occurs under the control of more abstract, verbally constructed, and socially mediated consequences. For example, "being a lovable person," "being a good parent," "being a good citizen" are all ultimate reinforcers in the repertoire of a person. The arbitrary relation of coordination between being a lovable person and complying will be established in a relation of opposition to consequences of not complying

and punishing to the extent that complying is the ultimate reinforcer or valued goal. This kind of augmenting based on generalized pliance can become problematic. Relational framing can be more complex and a good example is that of rumination or thinking over. According to RFT, rumination is considered a problem solving strategy as this is what people think that should be done when they want to make problems disappear. For a depressed person, ruminating is what is done in efforts to make problems disappear so that they can feel better. By feeling better, the depressed person believes that they can then pursue what is important for him or her. The relational frame sequence starts with rumination as a strategy to problem solving and for feeling better and feeling better then becomes the condition for valued goals. Essentially, the behavioural repertoire that a ruminating individual engages in has the condition that unless they feel better, they are unable to pursue valued goals. This chain of relational frames functions as an augmental whereby the avoided thoughts become even more aversive because they are established in opposition to pursuing valuable goals. The detrimental effects of avoidance are likely to become exacerbated when an individual is unaware of the difference between himself or herself having these thoughts and the actual contents of the thoughts (Barnes-Holmes et al., 2001; Luciano et al., 2004). This kind of rule-following eventually leads to many kinds of avoidant efforts if the private events are experienced as aversive and are in opposition to valued goals due to the inability to discriminate between the “I” as the context and the content of experiences in the form of thoughts, emotions etc. Further, these kinds of relational frames function as augmentals as long as the valued goal is reinforcing for the person (“I have to feel better so that I can pursue my goals”). Effectively, the described example above is a reflection of experiential avoidance. As more control efforts are used to avoid or escape aversive private events such as memories, emotions, thoughts, and bodily sensations, the more they are feared and the more entanglement occurs with private events in the long term. Consequently, life satisfaction reduces as more and more stimuli enter the relational network over time and acquire characteristics or functions of established relational frames.

The acquisition of characteristic relational frames is a result of the human ability for bidirectional responding. Bidirectionality is a basic principle in RFT which states that humans, as opposed to animals, are capable of responding bidirectionally. For example, when an individual is told A is equal to B, then the individual can derive the other implicit relationship that B is equal to A. Similarly, if an individual is told that C is smaller than B, then an individual is again capable of deriving the implicit relationship that C is also smaller than A. Although the ability for bidirectional responding is an important developmental milestone in language-able humans, it also participates in different rule-governed behaviours and opens the trap to experiential avoidance. Private events such as memories, affect, or thoughts elicited in the presence of aversive conditions can acquire aversive functions through bidirectional responding (Wilson, Hayes, Gregg, & Zettle, 2001). More specifically, relational frames become more complex as diverse thoughts and feelings acquire bidirectional functions and enter into frames of coordination with feared relational frames and in opposition to desired or valued goals, thus becoming susceptible to avoidance efforts. Essentially, bidirectional responding along with rule-governed behaviour in which deliberate avoidant efforts are maintained are the basis of psychological *inflexibility*.

In conclusion, the role of rule-governed behaviour in the development and enhancement of social control and awareness of long-term consequences of behaviour are important for the development of normal verbal behaviour but at the same time, their participation in psychological problems cannot be underestimated. The reduced benefits of rule-governed behaviour are usually brought about by increasing insensitivity to changes in contingencies. This leads to an increasing susceptibility to social consequences that interfere with effective tracking of behaviour. Tracking cannot work when the behaviour and consequences specified in the rule is incompatible with rule-following. Moreover, although augmenting normally contributes to behavioural flexibility, benefits of augmenting reduce with increasing insensitivity towards changing contingencies. In other words, as consequences become more

abstract, direct consequences become harder to contact. In this manner, augmenting can lead to the emergence of deliberate avoidance efforts that constitutes psychological *inflexibility*.

3.2 Empirical Evidence for Psychological Flexibility

In the last several decades a large body of evidence has accumulated suggesting that PF can function to facilitate well-being or can be considered a psychological vulnerability factor. Accordingly, PF has been examined in many ways. Low PF is associated with a range of psychopathological conditions and behavioural difficulties and has also been demonstrated to be distinct from other psychological constructs (Chawla & Ostafin, 2007). The evidence for PF has predominantly been investigated through correlational, experimental, and treatment mediation and moderation. A few longitudinal studies examining the predictive role of PF have been conducted, however, the number of studies remain very small. A brief review of research on PF is presented below, but first the operationalization of the PF measure used in the present study is described.

3.2.1 Operationalizing Psychological Flexibility

Psychological flexibility has widely been measured by the Acceptance and Action Questionnaire (AAQ; Hayes et al., 2004) in adults. The AAQ is a self-report measure that assesses the two aspects of those low in PF, namely experiential avoidance and cognitive fusion. Respondents are asked to rate the degree to which they feel entangled with their difficult thoughts, the extent to which private experiences are negatively evaluated, the extent to which they avoid, escape or control their emotions and the extent to which in the presence of difficult thoughts and feelings, they are unable to act effectively. The 9 and 16 item versions were developed to capture the PF phenomena as a unidimensional construct, and reliability and validity studies on all versions predominantly point to a single latent factor (Hayes et al., 2004). The AAQ has been used in a wide array of studies. In a meta-analytic study, the AAQ was shown to predict a wide range of psychopathological and well-being measures, including depression, anxiety, general mental health, quality of life, job satisfaction, future absenteeism, and future performance on the job (Hayes et al., 2006).

Although the AAQ demonstrated good reliability and criterion-related, convergent, predictive, and discriminative validities at the time of development, there has been a problem with the internal consistency of the AAQ in subsequent studies (Bond et al., 2011). Low alphas were observed particularly in community samples and subpopulations with low education and amongst those with English as a second language. Revisions to address the weaknesses of the AAQ, led to the development of the AAQ-II (Bond et al., 2011). In addition to the AAQ-II, several variants of the AAQ for particular problems were also developed. Some of the problems for which the AAQ measure has been modified include smoking (Farris, Zvolensky, DiBello, & Schmidt, 2015), substance abuse (Luoma, Drake, Kohlenberg, & Hayes, 2011), body image (Sandoz, Wilson, Merwin, & Kate Kellum, 2013), weight (Lillis & Hayes, 2008), auditory hallucinations (Shawyer et al., 2007), chronic pain (McCracken, Vowles, & Eccleston, 2004), tinnitus (Westin, Hayes, & Andersson, 2008) and diabetes (Gregg, Callaghan, Hayes, & Glenn-Lawson, 2007). In the disorder specific versions, the more general terms pertaining to thoughts, feelings, and actions in the items have been replaced with more domain specific terms of the clinical problems. Similarly, an entirely new measure of PF, the Action and Fusion Questionnaire for Youth (AFQ-Y; Greco, Lambert, & Baer, 2008), was developed specifically for children and adolescents.

Similar to the AAQ, the AFQ-Y also assesses experiential avoidance and cognitive fusion and high scores on the AFQ-Y are indicative of psychological *inflexibility* and low scores psychological flexibility. The AFQ-Y is a self-report measure with a short version consisting of 8 items and a long version consisting of 17 items (Greco et al., 2008). The internal consistency reliability for the AFQ-Y has been high in youth populations with reported alphas ranging from .81 to .93 (Fergus et al., 2012; Greco et al., 2008; Howe-Martin et al., 2012; Schmalz & Murrell, 2010). The intended purpose of the AFQ-Y was to assess PF in children at least 10 years of age and also to enhance comprehension through the reduced use of ACT specific language in the items. The items use simple language to facilitate more valid responding among young people. Content-wise, the items in the AFQ-Y represent general response behaviours

although items are specific to setting events, reminiscent of the domain specific AAQ measures. A sample question would be “I do worse in school when I have thoughts that make me feel sad.”

Although the AFQ-Y was developed for children and adolescents, the AFQ-Y should ideally show a meaningful association with existing measures of PF and be comparable in relation to measures of psychopathology and well-being. To examine the relationship between the AFQ-Y and AAQ-II, two different samples of adults were assessed (Fergus et al., 2012). In the first sample consisting of college students, the reading level and factor structure for the using the AFQ-Y was assessed. In the second sample, 115 patients with multiple diagnoses from an intensive anxiety outpatient program completed several clinical measures in addition to the AFQ-Y and AAQ-II which included the Anxiety Sensitivity Index-3 (Taylor et al., 2007), Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), the Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998), the Beck Anxiety Inventory (BAI; Beck, Epstein, Brown, & Steer, 1988), the Panic and Agoraphobia Scale (PAS; Bandelow, 1999), and the Dimensional Obsessive-Compulsive Scale (DOCS; Abramowitz et al., 2010).

In both samples, the factor structure of the AFQ-Y yielded a one-factor model, confirming its construct validity. A high value for the Cronbach’s alpha statistic ($\alpha = .93$) indicated excellent internal consistency in the sample involving college students. In the clinical population, internal consistency for the AFQ-Y was reported as $\alpha = .90$ and for the AAQ-II $\alpha = .89$. The correlations between the AFQ-Y and AAQ-II in the second sample was $r = .70$. The convergent correlations between the two PF measures were considered high enough to demonstrate that the same underlying construct was being measured; however, this was further tested by incremental concurrent validity tests. The AFQ-Y incrementally predicted the scores of all psychological symptoms above and beyond the AAQ-II except for the obsessive compulsive measure (Fergus et al., 2012). However, the AAQ-II did not predict any unique variance for all psychological symptoms except for the obsessive compulsive measure.

In another study comparing the AFQ-Y and AAQ-II in adults, a college sample completed the AFQ-Y, the AAQ-II, the Symptom Checklist-90-R (SCL-90-R; Derogatis, 1994), the Depression Anxiety Stress Scale (DASS; Lovibond & Lovibond, 1995), the Kentucky Inventory of Mindfulness Skills (KIMS; Baer, Smith, & Allen, 2004) and the Quality of Life Inventory (QOLI; Frisch, 1994) (Schmalz & Murrell, 2010). The factor structure of the AFQ-Y also yielded a one-factor model and the Cronbach's alpha was similar to the above sample of college students ($\alpha = .92$). In this study, the AFQ-Y did not predict unique variance for the quality of life measure above and beyond the AAQ-II (Schmalz & Murrell, 2010).

In conclusion, the AFQ-Y was found to be applicable for all ages starting from the fifth or sixth grade comprehension levels (Greco et al., 2008) and was comparable with the AAQ -II in terms of the underlying construct, in measuring symptom-based psychological constructs (Fergus et al., 2012), and in measuring well-being in terms of quality of life (Schmalz & Murrell, 2010). Moreover, the AFQ-Y was inversely related to measures of psychological symptoms and directly related to measures of well-being (Greco et al., 2008).

3.2.2 Evidence for PF in Adults and Adolescents

Increasing empirical evidence shows that PF acts as a broad vulnerability for various kinds of emotionally-related distress. The PF construct has been examined in several ways since its initial application in ACT with a wide range of psychological disorders and problems having been investigated (Ruiz, 2010). Measures of PF, namely the AAQ and AFQ-Y, correlate as expected with a broad range of measures and forms of psychopathology, measures of behavioural medicine (e.g. chronic pain), workplace variables (e.g., job burnout, propensity to innovate, workplace well-being and performance), measures of coping, and measures of quality of life and well-being (Hayes et al., 2006). Several meta-analyses involving the PF construct have been conducted to date. One of the first meta-analyses involved 32 studies and a total of 6628 participants (Hayes et al., 2006). Higher PF was positively associated with higher quality of life, positive emotional experiences, and perceived well-being (Hayes et al., 2006). Low PF was associated with a range of psychological disorders including depression, anxiety,

somatisation, PTSD (re-experiencing and arousal subscales), social phobia, agoraphobia, blood/injury phobia, anxiety sensitivity, fear of suffocation, fear of body sensations, stress, trauma-related symptoms and beliefs, dissociative experiences, alcohol dependence, job-induced tension, worries, fear of intimacy, and pain (Hayes et al., 2006). Low PF may also play a role in eating disorders, specifically in patients with anorexia nervosa (Rawal, Park, & Williams, 2010) whereas psychological acceptance is associated with lower levels of disordered eating behaviours (Masuda, Price, Anderson, & Wendell, 2010).

In a second meta-analysis by Ruiz (2010), empirical evidence for PF was examined in correlational, experimental, component, and outcome studies. The main highlight of the correlational studies was that the weighted average correlation between PF and depressive symptoms was $r = -.55$ and between PF and anxiety symptoms was $r = -.52$. The high correlations indicate that the PF construct potentially plays an important role in emotion-related psychological problems. However, correlational studies only indicate that there is an association between two variables. In order to determine whether PF plays an active role in psychological processes, results from experimental studies are briefly examined below.

In the experimental studies reviewed, participants' levels of PF were assessed in conjunction with experimental tasks such as the examination of tolerance by keeping hands in cold water (Zettle et al., 2005), the assessment of performance on a challenging perceptual-motor task (Zettle, Petersen, Hocker, & Provines, 2007), and a comparison between acceptance and suppression conditions using a carbon-dioxide enriched air challenge (Feldner, Zvolensky, Eifert, & Spira, 2003). Overall, participants who scored high on the AAQ (low PF) in these studies, had found the tasks more challenging and displayed more emotional discomfort in comparison to those who scored low on the AAQ. In another experimental study that assessed high vs. low levels of PF, emotional reactions of participants were compared when they viewed pleasant, neutral, and unpleasant films (Sloan, 2004). In this study, participants with lower levels of PF tended to report higher levels of emotional experiences along with higher heart rates when they viewed pleasant and unpleasant films in comparison to the participants with

higher levels of PF (Sloan, 2004). In conclusion, the pattern of findings seems to suggest that those who were low in PF tended to report greater emotional distress across different experimental tasks. Moreover, the differences observed in emotional reactions between high vs. low PF indicates that the PF construct possibly acts as an emotion regulation strategy.

Additionally, Ruiz (2010) reviewed several empirical reviews that compared the ACT protocol and other established treatments. In ACT, the goal of treatment is to enhance PF by using mindfulness and acceptance processes along with behavioural change processes to change the function of private experiences rather than the content of private experiences with consideration given to values and goals that matter to the individual. ACT methods involve metaphors and exercises used for integrating PF processes as a whole. These studies may not have necessarily used PF measures to assess efficacy but therapists involved in the studies have predominantly been trained with the ACT protocol. Three meta-analyses that assessed the clinical efficacy of ACT based on evidence from RCTs and processes of change were examined (Hayes et al., 2006; Ost, 2008; Powers, Zum Vorde Sive Vording, & Emmelkamp, 2009). In approximately 21 RCT's, ACT interventions were found to be better than control or no treatment, treatment as usual (TAU), and also better than structured interventions (Hayes et al., 2006). In the review by Ost (2008), 15 RCT's were considered and ACT was similarly found to be superior to no treatment, to TAU, and other active treatments. Similar conclusions were established in another review in which ACT was found to be better than wait-lists and TAU but not significantly better than other established treatments (Powers et al., 2009). In conclusion, the three reviews established that ACT interventions were effective and significantly improved specific psychological symptoms but more evidence is needed to show that ACT or the enhancement of PF is clinically efficacious in comparison to established treatments, in particular, CBT. These reviews also demonstrate support for the PF construct as mindfulness and acceptance processes that can impact broadly on human functioning and contribute to positive outcomes through therapy.

ACT interventions have only recently started being examined in adolescent populations for specific problems. Most of the adolescent studies have either been pilot or preliminary investigations with the purpose of determining efficacy of the ACT protocol and therefore sample sizes have been small. Adolescents' ages in these studies ranged from 11 to 18 and clinical samples ranged from non-severe to severely disordered and delinquent. Most of the ACT intervention studies reviewed below have used the AFQ-Y as an assessment measure to gauge improvement in participants before and after treatment. ACT interventions have been conducted in adolescents with specific psychological problems such as eating disorders and obsessive-compulsive disorders, in adolescents with chronic pain, and in school settings.

In a systematic review comparing processes of change in ACT versus CBT in anxious adolescents ($N = 49$, 12-17 years), significant decreases in the AFQ-Y were found following treatment (Swain, Hancock, Hainsworth, & Bowman, 2013). The AFQ-Y has also been used to gauge the influence of an ACT intervention in adolescents with eating disorders. In a pilot study, six adolescents with anorexia nervosa and their parents participated in a family-based ACT intervention (Merwin, Zucker, & Timko, 2013). All but one participant showed improvements in weight and had reduced attempts to control eating, as well as improvement in interpersonal relationships, personal adjustment, self-reliance, and self-esteem. The AFQ-Y was used as part of the pre-and-post assessments. For most participants, significant declines were observed in the AFQ-Y from pre-to-post intervention (except for two participants). Similarly, in another study, three adolescents with obsessive-compulsive disorder were treated with 8-10 sessions of ACT with results showing mean reductions in self-reported compulsions of 40% from pre-treatment to post-treatment with gains maintained at 3-month follow-up (Armstrong, Morrison, & Twohig, 2013). Ratings on the AFQ-Y and Children's Yale-Brown Obsessive Compulsive Scale also showed significant improvements from pre-treatment to post-treatment.

In the area of health psychology, ACT was compared to TAU in children with chronic pain and significant improvements were observed in the ACT condition in the areas of fear of

re-injury, pain interference, and quality of life (Wicksell, Melin, & Olsson, 2007).

Improvements were maintained at 6 month follow-up.

In school settings, ACT was compared to passive coping in a RCT study in a school setting with significant improvements in outcomes and measures of stress and PF for up to two years later (Livheim, 2004). Subsequent studies have used ACT in comparison to TAU in school-based group intervention programs in adolescents with stress and depression (Livheim et al., 2014) and in adolescents with ADHD (Murrell, Steinberg, Connally, Hulsey, & Hogan, 2014). Findings from the first study indicated that ACT has potential as a group intervention as significant reductions were observed in depressive symptoms and stress in comparison to the TAU group and that AFQ-Y scores decreased in the ACT group (Livheim et al., 2014). In adolescents with ADHD, significant change was seen in the Behaviour Assessment Scale for Children and the values assessment, however, the AFQ-Y was not useable as these adolescents were unable to comprehend what the items meant even though they were able to read them (Murrell et al., 2014).

Another ACT group intervention study was conducted in a school in order to assess the useability of the AFQ-Y in adolescents with behavioural problems. Fifteen adolescents (aged 12-15 years), assessed as either high or low on the Behaviour Assessment System for Children in a school setting (BASC; Reynolds & Kamphaus, 2004), participated in two defusion exercises (Luciano et al., 2011). The researchers attempted to differentiate between types of relational frames in the defusion exercises in order to determine their usefulness in interventions among low-risk and high-risk adolescents (Luciano et al., 2011). The Spanish version of the AFQ-Y and the acceptance without judgment scale of the Kentucky Inventory of Mindfulness Skills (KIMS; Baer et al., 2004) were used to assess the difference between pre and post training in the two defusion protocols. In the low risk group, decreases in the AFQ-Y and increases in the accepting without judgment subscale (KIMS) were observed with a 100% reduction rate in problematic behaviours. In the high-risk group, a reduction in problematic behaviours and a significant increase in accepting without judgment scores were observed,

however, no significant changes in the AFQ-Y was observed. The results of this study indicate that the AFQ-Y can be used to discriminate the effectiveness of interventions between low-risk groups and high-risk groups of adolescents.

Although the studies conducted with adolescents are preliminary, they still are an indication that PF can be enhanced in adolescents through psychotherapeutic interventions and that psychological outcomes can be improved. Unlike other trait measures such as self-esteem for example, PF can be modified in treatment. But nevertheless, more research is required to gain a better understanding of how PF processes function in adolescence and whether the AFQ-Y can differentiate between varied levels of PF in conjunction with other risk factors.

3.2.3 Psychological Flexibility as a Psychological Vulnerability

Many of the above listed disorders belong to the Axis I category of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013) and certain forms of avoidance are a predominant feature in disorders such as depression, anxiety, PTSD, and alcohol dependence in adults (Plumb, Orsillo, & Luterek, 2004; Stewart, Zvolensky, & Eifert, 2002; Tull, Gratz, Salters, & Roemer, 2004) and in adolescents (Venta, Sharp, & Hart, 2012). Moreover, the comorbidity among the listed disorders suggests that there are common underlying processes that contribute towards their co-occurrence. For example, depression is known to be comorbid with many disorders and psychological difficulties such as anxiety (Copeland et al., 2014). In a study conducted to determine risk factors of substance abuse in a predominant male veteran sample who were seeking treatment, PF was found to be strongly negatively correlated with anxiety sensitivity, depression, and anxiety (Forsyth, Parker, & Finlay, 2003). Moreover, from pre-to-post treatment, significant increases in PF were observed in all categories of substance use. The PF construct also discriminated between those with primary substance use disorder and comorbid substance use disorders (Forsyth et al., 2003). The strong negative correlations between PF and psychological distress and PF and psychopathological variables suggest that low PF is an underlying psychological vulnerability.

In survey research with inpatient adolescents, the AFQ-Y demonstrated sensitivity and specificity in the diagnosis of anxiety disorders in a clinical sample (Venta et al., 2013). However, the AFQ-Y was not able to separate other comorbid psychological disorders (especially depression) from pure anxiety disorders as intended by the researchers in this study. But this may suggest that low levels of PF represent co-occurring processes that underlie a range of psychological disorders as have been found in other adult studies that used the AAQ. In this respect, PF can be considered as a potential transdiagnostic approach to psychopathology (Boulanger et al., 2010).

Findings from non-clinical samples of adolescents support the hypothesis that low PF is a marker of vulnerability. In empirical research with two samples of adolescents ($N = 513$ and $N = 675$), PF was shown to be negatively correlated with clinical measures of anxiety, somatisation, and behavioural problems and positively correlated with quality of life, social skills, and academic competence (Greco et al., 2008). In another empirical study, adolescents from two high schools ($N = 211$) were surveyed to examine the relationship between non-suicidal self-injury (NSSI) and experiential avoidance using the AFQ-Y (Howe-Martin et al., 2012). NSSI was found to be common in adolescents (33% of those surveyed), with more females engaging in these behaviours. Gender differences were also found for the AFQ-Y and a separate measure of thought suppression with females reporting higher scores in general. Thought suppression and alexithymia appeared as significant differentiating variables between adolescents with and without a history of NSSI but higher levels of experiential avoidance/cognitive fusion correlated with reported multiple psychopathological behaviours, such as disordered eating, substance abuse, and suicidal ideation/behaviours in addition to NSSI (Howe-Martin et al., 2012).

Mediational studies between PF, coping styles, and psychopathology provide further evidence of PF as a potential transdiagnostic variable. PF was found to be distinct from several other coping strategies where PF mediated the relations between maladaptive emotional response styles and uncontrollability on daily mood and anxiety-related distress using

experience sampling method (Kashdan et al., 2006). For example, PF fully mediated the effects of expressive suppression and cognitive reappraisal and daily functioning. The conclusion to the study suggested that low PF is a “toxic self-regulatory diathesis” underlying other coping and emotion regulation strategies and that through this mechanism, diminished well-being, *less frequent positive affective events* (emphasis added), and increased distress were experienced (Kashdan et al., 2006, p. 1315).

In other recent mediation studies, low PF has been found to partially and fully mediate a wide range of coping styles and emotionally related psychological symptoms. For example, PF partially and fully mediated the relation between childhood psychological abuse and adult psychological distress (Reddy, Pickett, & Orcutt, 2006), materialism and diminished well-being (Kashdan & Breen, 2007), passive coping and depression/anxiety, passive coping and emotional/psychological well-being (Fledderus, Bohlmeijer, & Pieterse, 2010), anxiety sensitivity and borderline personality disorder (Gratz, Tull, & Gunderson, 2008), self-reported negative affect intensity and childhood trauma on the tendency to engage in problem behaviours (Kingston, Clarke, & Remington, 2010), heart beat reactivity and cortisol reactivity on child maltreatment and PTSD symptoms (Shenk, Putnam, & Noll, 2012), rational coping and detached/emotional coping on stress and depression for chronic pain (Costa & Pinto-Gouveia, 2011), fear of cognitive dyscontrol and disordered eating (Fulton et al., 2012), and cognitive flexibility on PTSD severity and depression (Palm & Follette, 2011). The significant mediational role of low PF shows that it is an underlying vulnerability that impairs adaptive coping and perpetuates maladaptive coping processes. Although the mediational studies provide an indication of the role of PF processes in the development of more severe psychological disorders, PF is still considered a correlate of other psychological processes. It remains unclear as to whether PF precedes these other processes or is a consequence of them.

In addition to the mediating role of low PF as an explanation for comorbidity among psychological disorders, processes proposed in the PF construct have also been shown to be distinct from other coping and emotion regulation response styles. The PF measure

distinguished between individuals with severe and normal levels of depressive symptoms in comparison to other emotion dysregulation measures such as the difficulties in emotion regulation measure (DERS; Gratz & Roemer, 2004). PF also mediated the association between fear of cognitive dyscontrol and fear of publicly observable anxiety reactions and depressive symptoms (Tull & Gratz, 2008). In another study, the motivation to drink in young adults was examined by looking at the role of anxiety sensitivity, PF, and alexithymia (Stewart et al., 2002). PF and alexithymic coping were found to partially mediate the relationship between anxiety sensitivity and coping-motivated drinking but PF was a stronger mediator than alexithymia. In a different study however, PF was not found to be a stronger mediator than alexithymia in the relationship between avoidant coping and fear of uncertainty with psychosocial outcomes (Berrocal et al., 2009). Both PF and alexithymia appeared to be independent psychological dimensions in relation to psychosocial well-being. High anxiety-sensitive individuals were more likely to cope by drinking when they were also high in EA (Stewart et al., 2002). In a study examining PF and forgiveness in the relationship between traumatic interpersonal events and PTSD, both PF and forgiveness partially mediated the relationship (Orcutt, Pickett, & Pope, 2005). Individuals who experienced interpersonal trauma were more at risk of developing PTSD especially when they were low in PF and also when they were unwilling to forgive an interpersonal wrongdoing.

The psychological vulnerability aspect of PF has also been investigated in regression studies. PF correlates with a number of coping and emotion regulation strategy measures and other psychological measures that are considered vulnerability factors and/or risk factors. Low PF correlates with thought suppression and self-focused attention (Glick & Orsillo, 2011), avoidant coping, fear of uncertainty (Berrocal et al., 2009), anxiety sensitivity (Kampfe et al., 2012), and alexithymia (Berrocal et al., 2009; Howe-Martin et al., 2012; Stewart et al., 2002). Theoretically, these measures are also conceptually assessing fear and/or avoidance of unwanted private events. However, PF has been shown to contribute unique variance in explaining psychological outcomes in addition to these other coping strategies and psychological

vulnerability measures. The additional unique variance attributed to the PF construct is possibly due to its pervasive pathological function underlying many forms of emotion regulation strategies used in many contexts and is likely to contribute to greater life restrictions and further to psychopathology (Boulanger et al., 2010).

Research on PF in conjunction with other vulnerability/risk factors has also been conducted in order to understand pathways to certain psychological symptoms. For example, PF and other risk factors such as the difficulties with emotion regulation (as measured by the DERS), distress intolerance and low PF were examined in relation to symptom severity in borderline personality disorder (BPD; Iverson, Follette, Pistorello, & Fruzzetti, 2012). Only PF and difficulties with emotion regulation contributed significantly to BPD symptom severity. However, only low PF remained a unique contributor of BPD symptom severity in a regression analysis after controlling for depressive symptoms and difficulties with emotion regulation (Iverson et al., 2012). In a study examining commonalities and differences in major depressive disorder (MDD) and borderline personality disorder (BPD), it was found that negative affect was associated with both disorders while positive affect was associated with MDD and affect intensity with BPD (Cheavens & Heiy, 2011). Low PF was found to partially mediate the relationship between affect and symptoms and MDD and BPD. The findings in this study suggests that although PF played a role in exacerbating the experience of affect in MDD and BPD, affect still plays an important role in delineating symptoms in MDD and BPD symptoms. It is unclear whether affect had an effect on PF or PF had an effect on affect.

In another study, the Brief COPE (a measure of many coping styles; Carver, 1997) was compared to the AAQ-II (Karekla & Panayiotou, 2011). Both constructs overlapped in predicting psychological distress and quality of life but PF added unique variance to the model. The findings suggested that PF accounts for many coping styles and explains additional variance over and above established measures of coping (Karekla & Panayiotou, 2011).

PF has also been investigated with mindfulness measures such as the Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006). This study examined the moderating

effects of PF and mindfulness on the trait-like Behavioural Inhibition System (BIS) sensitivity and psychological distress as measured by the Depression, Anxiety and Stress Scales, (DASS; Hamill et al., 2015; Lovibond & Lovibond, 1995). The BIS sensitivity scale is an aversive motivational system that links the functions of the brain to behaviour and affect and is said to be highly sensitive to punishment and non-reward (Carver & White, 1994). BIS sensitivity is highly linked with negative emotions such as fear, anger, guilt, and sadness (Dillard & Peck, 2001). Low PF and certain facets of mindfulness (e.g. nonreactivity subscale) moderated the relationship between BIS sensitivity and psychological distress symptoms. This study suggests that heightened BIS sensitivity can be tempered with mindfulness-and-acceptance based practices and provides support for using ACT as a treatment modality (Hamill et al., 2015). In another study that assessed the Mindful Attention and Awareness Scale (MAAS; Brown & Ryan, 2003) and the AAQ-II in an adult clinical sample, it was found that the correlation between dispositional mindfulness and PF was $r = .558$ ($p < .01$) (Silberstein, Tirch, Leahy, & McGinn, 2012). The positive high correlations between PF and dispositional mindfulness suggested that elements of the two constructs may be measuring similar processes that consist of an open awareness and being nonjudgmental and accepting of emotional experiences in the present moment.

3.3 Psychological Flexibility and Stress and Coping in Adolescents:

Theoretical overlaps and distinctions

3.3.1 Coping in Adolescents

Due to biological, cognitive, and social developmental changes, adolescents experience increased levels of stress and corresponding appraisals of stress characterized by intense negative emotions (Folkman & Moskowitz, 2004; Larson & Ham, 1993; Rosenblum & Lewis, 2003). Stress and emotion are often viewed as interdependent as emotion is often present when there is stress (Lazarus, 1999). Appraisals of stress initiate a coping process in order to deal with the potential loss of achieving important goals. Coping is a complex and multidimensional

process in which individual characteristics and the socio-contextual environment influence the appraisal of stress and coping resources (Folkman & Moskowitz, 2004; Rudolph, Flynn, Abaied, Groot, & Thompson, 2009). Coping is strongly associated with the regulation of emotions as emotions are featured throughout the coping process (Folkman & Lazarus, 1988). In the initial coping process, the first task of coping is mainly to down-regulate negative emotions as they can interfere with other instrumental coping tasks. This is called emotion-focused coping (Folkman, 1984). Researchers have found that the consistent use of emotion-focused coping featured with different kinds of avoidant strategies can be associated with negative mental health outcomes, while other kinds of coping resources such as seeking social support and problem-focused coping can be associated with a wider range of outcomes, both positive or negative outcomes, and can also be neutral (Folkman & Moskowitz, 2004). In a recent review of coping styles, adolescents were found to switch to using more emotion-focused coping strategies with avoidant features such as distraction and escape when they experienced uncontrollable stressors and interpersonal problems (Zimmer-Gembeck & Skinner, 2011).

Coping styles appear to play a key role in the link between stressors and adolescent psychopathology (Dumont & Provost, 1999; Seiffge-Krenke, 2000). One of the most prevalent correlates of emotional and behavioural symptoms in children and adolescents is the use of avoidant coping, including both behavioural efforts and the avoidance of thinking about the problem (Aldridge & Roesch, 2008; Asarnow, Carlson, & Guthrie, 1987; Compas, Malcarne, & Fondacaro, 1988; Ebata & Moos, 1991; Garnefski, Kraaij, & van Etten, 2005; Herman-Stahl, Stemmler, & Petersen, 1995; Seiffge-Krenke, 1993; Silk et al., 2003). Researchers have found that adolescent anxiety and depression were often influenced and exacerbated by avoidant coping. Longitudinal studies have pointed to the pernicious effects of avoidant coping in the long term. The use of avoidant coping (versus approach-oriented coping) is associated with increased depressive symptoms and depression later on in life (Seiffge-Krenke, 1995). In another study, the long term effects of the tendency to cope by avoiding and withdrawing, irrespective of when the avoidant behaviour emerged, eventually led to increases in depressive

symptoms and continued to influence the outcome of later development of depression (Seiffge-Krenke & Klessinger, 2000). Additionally, suppression and avoidance predicted an increase in emotional and behavioural problems in adolescents regardless of changes in life stress (Flouri & Mavroveli, 2013).

Three main conclusions can be drawn from the adolescent stress and coping literature. First, even though adolescents become more flexible with the ability to switch among coping strategies, they tend to rely on the same strategies that may have worked well in specific situations without taking into account situational differences (Lougheed & Hollenstein, 2012). This is mainly because they have not had experiences in the past that may have exposed them to the use of different coping styles in different situations. As a result, they tend to become insensitive to the differences in the context at hand. Second, the very capabilities applied for future planning as a result of an increase in cognitive capacities, also render them susceptible to worrying about the future (Flouri, Mavroveli, & Panourgia, 2013; Zimmer-Gembeck & Skinner, 2011). And by the same token, the increase in their quest for autonomy also makes them susceptible to using escape strategies when avoidance is the purpose (Zimmer-Gembeck & Skinner, 2011). Third, avoidance strategies are the predominant coping strategies used in adolescence and their long-term effect is clearly associated with emotionally-related symptoms (Seiffge-Krenke & Klessinger, 2000; Silk et al., 2003). Although the development in cognitive reasoning and the increase in the range of self-reliant coping strategies lead to effective action and emotion regulation, the same acquired abilities also introduce vulnerabilities. Elements of these conclusions are all components of the PF construct and therefore it is important to further explore the construct in relation to other emotion regulation models to better understand how it contributes to adolescent well-being and also the maintenance of psychological problems.

3.3.2 Psychological Flexibility and Emotion Regulation in Adolescents

The incorporation of emotion regulation strategies in adolescent coping have gained increased attention from stress and coping researchers. Coping and emotion regulation strategies are highly inter-related but they have also been found to be different or specific to the

situation (Flouri & Mavroveli, 2013). Coping has been referred to as “conscious and volitional efforts to regulate emotion, cognition, behaviour, physiology, and the environment in response to stressful events or circumstances” (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001, p. 89). Some of the predominant coping styles include distraction, escape, social withdrawal, helplessness, positive restructuring, and support seeking (Zimmer-Gembeck & Skinner, 2011). Although coping and emotion regulation have emerged from different psychological research areas, they are nevertheless closely related. The link between coping and emotion regulation lies in the strategy used to regulate emotions when stress is encountered.

Emotion regulation has emerged more recently than coping and therefore its investigation in adolescents is also recent. Most of the research in adolescents has been drawn from the adult literature. In a recent meta-analysis, large effect sizes were found for maladaptive strategies such as rumination and medium to large for avoidance and suppression (Aldao et al., 2010). In contrast, for adaptive emotion regulation strategies, medium to large effect sizes was found for problem-solving and small to medium effect sizes for reappraisal and acceptance. In general, cognitive reappraisal and problem solving are strategies thought to be adaptive across a variety of contexts and are negatively associated with emotional and behavioural problems while rumination, avoidance, and suppression contribute to emotional and behavioural problems. In adolescents, emotion dysregulation has been shown to be a mediator of the association between stressful life events and internalizing disorders, especially in older adolescents over time (McLaughlin & Hatzenbuehler, 2009). The potential role of mindfulness as an adaptive emotion regulation strategy is also emerging in adolescents (Chambers et al., 2014).

Two predominant models of coping and emotion regulation in adolescents have been identified in the extant literature: the hierarchical voluntary and involuntary coping model proposed by Compas and colleagues and the process model of emotion regulation proposed by Gross and colleagues (Compas, Connor, Saltzman, Thomsen, & Wadsworth, 1999; Gross & Thompson, 2007). Both models capture different adaptive and maladaptive emotion regulation

strategies. Evidence for the two models has also been empirically replicated in a number of studies. More recently, another model has been gaining attention. This model can be referred to as the difficulties with emotion regulation model proposed by Gratz and Roemer (2004). In this model, several mindfulness aspects, for example, an awareness and acceptance of emotions, are incorporated within a multidimensional approach. These aspects of emotion regulation have not been considered in other models. In the following section, first the hierarchical voluntary and involuntary coping model is described followed by the process model and the difficulties in emotion regulation model. Corresponding research findings are also presented.

3.3.2.1 The hierarchical voluntary and involuntary coping model

Emotion regulation strategies can also be seen as part of the hierarchical voluntary and involuntary coping model which has been empirically replicated in clinical and non-clinical samples of adolescents (Connor-Smith, Compas, Wadsworth, Thomsen, & Saltzman, 2000; Langrock, Compas, Keller, Merchant, & Copeland, 2002; Wadsworth & Compas, 2002). Voluntary responses, also known as controlled responses, are strategies used as a preference. Involuntary or automatic responses are considered strategies that individuals use automatically when they encounter unpleasant stimuli. Involuntary strategies eventually take on a life of their own, as in the example of rumination. Voluntary strategies can further be categorized as active engagement with and passive disengagement from the stressor. Within active engagement, primary and secondary control strategies are reflective of the way an individual views the stressor (Thurber & Weisz, 1997). Primary control is an attempt to engage with the stressor by modifying negative aspects of the situation (e.g. problem-solving), while secondary control is an attempt to make the best of the situation given the circumstances, and utilizes strategies such as distraction and cognitive restructuring.

The experience sampling method was used to explore coping and emotion regulation strategies, based on the voluntary and involuntary coping model, in real time, as they unfolded in daily life among the adolescent participants (Silk et al., 2003). Adolescents who were unable to regulate negative emotions, including sadness, anger, and anxiety, were found to be more

vulnerable to internalizing and externalizing disorders when compared to those who recovered from these emotional experiences more easily. Contrary to their expectations, primary and secondary control strategies did not have a systematic effect on the regulation of emotions. None of the active engagement strategies, such as problem-solving, emotional expression, cognitive restructuring, and distraction, were reported as being used to regulate negative affect effectively. Instead, emotion regulation strategies that were more influential were disengagement and involuntary engagement but these could also prove counterproductive. Disengagement strategies, such as avoidance, denial, escape, or wishful thinking, and involuntary strategies, such as rumination, were all detrimental as they supported the maintenance of higher levels of anger and sadness. Furthermore, disengagement and involuntary strategies were associated with higher levels of depressive symptoms and problem behaviours, whereas primary and secondary control strategies were not highly associated with psychological symptoms. Findings from this study highlight a few important points about emotion regulation in adolescents which are elaborated below.

First, the social context of adolescents was taken into consideration with the use of the experience sampling method but the emotion regulation strategies from the hierarchical voluntary and involuntary model explained only a part of how individuals treated the experience of emotions. Thus, there appears to be other processes involved in explaining how these adolescents experienced emotions. Second, avoidance and its many forms played a large role in how these adolescents adapted to negative experiences. Disengagement from a negative experience reduces exposure towards the experience and therefore interferes with processes that support habituation of the experience and related emotion(s). In this way, the avoidance of internal experiences may in fact perpetuate painful events or situations through verbal behaviour that is rooted in the social context of adolescents. Third, emotion dysregulation, irrespective of the strategies used, is a common correlate of internalizing and externalizing behaviours in adolescents.

Leading researchers in emotion regulation argue that emotion regulation strategies are critical underlying factors of several forms of psychopathology. Additionally, it appears that the *inflexible* (emphasis added) use of emotion regulation strategies, irrespective of whether they involve active engagement or disengagement, influences the effectiveness of the strategies themselves (Bonanno, Papa, Lalande, Westphal, & Coifman, 2004). Emotion regulation strategies applied with the intention to avoid emotions or to control the coping process are more likely to be used rigidly without taking into account the context at hand (Boulanger et al., 2010).

3.3.2.2 The process model of emotion regulation

The process model of emotion regulation examines two strategies, cognitive reappraisal and expressive suppression (Gross, 1998; Gross & John, 2003; Gross & Thompson, 2007). In this model, emotion regulation strategies are categorized as either antecedent-focused strategies or response-focused strategies. Cognitive reappraisal (ability to think about a situation from other aspects in order to change its emotional impact) is an antecedent focused strategy which is employed early in the emotion elicitation process. Expressive suppression (suppression of emotional expression and experience) is a response-focused strategy used to manage distress when negative emotions are elicited. Reappraisers and suppressors differ considerably in most aspects of emotional, social, cognitive, and behavioural outcomes. Cognitive reappraisal strategies include the ability to approach stressful situations with optimistic attitudes and through reinterpretations of the situation, applying a concerted effort in repairing moods, and experiencing and expressing positive emotions more than negative emotions (Gross & John, 2003). On the social front, reappraisers also tended to have closer relationships with others and share both positive and negative emotions. Cognitive reappraisal was also positively correlated to well-being measures such as self-esteem and life satisfaction. In contrast, expressive suppression is known to have adverse effects on cardiovascular functioning, social support and relationships, and cognitive functioning in adults (Butler et al., 2003; Gross, 1998; Richards & Gross, 2000; Srivastava, Tamir, McGonigal, John, & Gross, 2009). Studies using the emotion regulation questionnaire (ERQ: Gross & John, 2003) demonstrated that the tendency to suppress

or conceal emotional responses was associated with feelings of inauthenticity among participants, who also reported being unaware about what they were feeling, being unsuccessful at mood repair, and ruminating about events. Moreover, efforts to suppress negative emotions also extended to the suppression of positive emotions and therefore less positive emotions were experienced (Gross & John, 2003).

In a few cross-sectional and longitudinal studies, the ERQ has been associated with internalizing disorders such as anxiety, depression, and social anxiety. Expressive suppression has been shown to be highly associated with depressive symptoms (Hughes, Gullone, & Watson, 2011; Lanteigne, Flynn, Eastabrook, & Hollenstein, 2014; Loughheed & Hollenstein, 2012). This seems to suggest that suppression is a strategy used considerably more by depressed individuals and that it contributes to the maintenance of depression as well as increases in levels of negative affect in comparison to the absence of cognitive reappraisal strategies (Aldao et al., 2010). Additionally, adolescents who used a limited range of emotion regulation strategies, including those who relied on specific response-focused strategies, such as suppression/concealing and emotional disengagement, and those who reported using no strategies tended to report more internalizing symptoms (Loughheed & Hollenstein, 2012). Furthermore, the developmental trajectories of expressive suppression and cognitive reappraisal seem to decrease as age increases albeit at different ages in females and males (Gullone, Hughes, King, & Tonge, 2010). With increase in age, suppression strategies stabilize, whereas – contrary to expectations, the ability to reappraise decreases. Adolescent girls reported more use of expressive suppression than young women, while cognitive reappraisal strategies remained the same for both age groups (Gullone et al., 2010).

The reviewed studies provide preliminary evidence for the role of emotion regulation in adolescent functioning, however, other aspects of emotion regulation are still lacking. The majority of studies with adolescents have used this model; but the breadth of studies is fairly narrow, focusing mainly on depression as an outcome. Moreover, only cognitive reappraisal and expressive suppression (Gross & John, 2003) have been examined to the almost complete

exclusion of other underlying emotion regulation processes that may be of importance in adolescence. For example, in a study that compared the use of emotion regulation strategies in internalizing symptoms in female adolescents (Eastabrook, Flynn, & Hollenstein, 2014), emotional awareness (as measured by the DERS; Gratz & Roemer, 2004) was shown to be important for cognitive reappraisal (as measured by the ERQ; Gross & John, 2003). Likewise, processes such as acceptance and mindfulness have been linked with psychological outcomes (e.g. depression and anxiety) that are highly associated with emotion dysregulation in adults and adolescents (Neumann et al., 2010; Roemer et al., 2009). For example, PF was found to be strongly associated with quality of life in individuals with psychotic symptoms when compared to the weak association between cognitive reappraisal and quality of life (Vilardaga, Hayes, Atkins, Bresee, & Kambiz, 2013). Moreover, no significant relationship was found between cognitive reappraisal and positive and negative affect whereas PF was associated with both of them. Further, lagged-temporal analyses also suggested that PF and cognitive reappraisal are two distinct processes (Vilardaga et al., 2013). Together these findings suggest that there are more processes involved in emotion regulation other than cognitive reappraisal and expressive suppression. The PF construct is likely to capture other distinct processes that may be relevant in understanding emotional and social well-being in adolescents.

3.3.2.3 The Difficulties in Emotion Regulation Model

The Difficulties in Emotion Regulation Scale focuses on six aspects of emotional engagement (DERS; Gratz & Roemer, 2004). These aspects are: nonacceptance of emotional responses, difficulties engaging in goal-directed behaviour, impulse control difficulties, lack of emotional awareness, limited access to emotion-regulation strategies, and lack of emotional clarity. The DERS has been tested in demographically diverse clinical and nonclinical samples and has been shown to apply similarly across age, gender, and racial group membership (see Ritschel, Tone, Schoemann, & Lim, 2015 for more details). Additionally, the DERS has been found to have good psychometric properties that include good test-retest reliability (Gratz & Roemer, 2004), good internal consistency (Neumann et al., 2010), and adequate convergent and

discriminant validity (Gratz & Roemer, 2004; Ritschel et al., 2015). Adequate convergent and discriminant validity of the DERS has also been demonstrated through its positive correlations with negative affect (Johnson et al., 2008; Roemer et al., 2009) and negative correlations with positive measures such as mindfulness (Baer et al., 2006) and self-compassion (Roemer et al., 2009). In a number of studies, maladaptive emotion regulation strategies, as measured by the DERS, have been found to correlate strongly with substance abuse (Fox, Axelrod, Paliwal, Sleeper, & Sinha, 2007), relational aggression (Gratz, Paulson, Jakupcak, & Tull, 2009), and non-suicidal self-injury (Gratz & Roemer, 2008). Most of these studies have used emerging adult and adult populations, however, research using the DERS in adolescent populations is growing.

Similar to research in the adult population, the DERS has been used in clinical and nonclinical adolescent populations. The factor structure of the DERS found in adults was also replicated in samples of adolescents (Neumann et al., 2010; Weinberg & Klonsky, 2009). Notable gender differences were found on some factors with females reporting significantly higher scores on emotional nonacceptance and emotional awareness, but lower scores on access to effective emotion regulation strategies in comparison to their male counterparts (Neumann et al., 2010). Males reported lower emotional awareness but were on par with females on difficulties controlling impulsive behaviours when distressed. The DERS also accounted for a larger variance in internalizing disorders (i.e. anxiety and depression) and a smaller variance in externalizing disorders (i.e. aggression and delinquent behaviour) (Bender, Reinholdt-Dunne, Esbjorn, & Pons, 2012; Neumann et al., 2010). Different factors of the DERS have also been useful in delineating among different forms of internalizing symptoms in males and females. In females, anxiety was predicted by limited access to emotion regulation strategies and lack of clarity, while in males, anxiety was predicted by nonacceptance of negative emotional responses alone. Emotion dysregulation has also been indicated in other maladjusted behaviours in adolescents. Emotion regulation difficulties have been found to be a correlate of maladaptive adolescent behaviours such as suicidal ideation, eating disorders, and use of alcohol and drugs

(Weinberg & Klonsky, 2009), strong negative emotional intensity and greater drinking to cope (Veilleux, Skinner, Reese, & Shaver, 2014), and violence (Miller, Vachon, & Aalsma, 2012). Difficulties in emotion regulation also influence risky sexual behaviour, increases the vulnerability for revictimization (Messman-Moore, Walsh, & DiLillo, 2010), increase the chances of sexual victimization, and contributes to poor risk perception (Walsh, DiLillo, & Messman-Moore, 2012).

In a study of rural high school students aged 14 to 18 years ($N = 7,978$; Pisani et al., 2013) difficulties in emotion regulation and poverty in emotion regulation strategies emerged as one of the most potent correlates of suicide attempts. Strong youth-parent communication partially buffered the effects of this association. For example, among 80 parent-child dyads with child mean age of 13.6, parental emotion dysregulation was associated with parent emotion invalidation and that this in turn was related to difficulties in emotion regulation in adolescents (Buckholdt, Parra, & Jobe-Shields, 2014). Moreover, difficulty regulating emotions in adolescents contributed in part to the association between parent invalidation and adolescent internalizing/externalizing symptoms. In another study, significant positive correlations were found between difficulties in emotion regulation and emotional symptoms after controlling for paternal psychological control and gender (McEwen & Flouri, 2009). Difficulties in emotion regulation mediated the association between paternal psychological control and emotional symptoms. The findings indicate that paternal parenting has an effect on emotional symptoms via emotion dysregulation.

It can be inferred from the studies above, particularly the parent-child dyad and paternal parenting studies, that adolescents who experience invalidation for emotional displays and those who are psychologically controlled may not seek support from parents. In contrast, adolescents who can trust and communicate with a parent or adult even when they have inadequate skills in emotion regulation are less likely to be at risk for attempting suicide. Given the findings from these studies, it is clear that both emotion regulation skills and the ability to seek support are

important processes in reducing psychopathological risk in adolescents, however, it remains unclear as to which of these factors is an antecedent of the other.

The difficulties in emotion regulation model and the DERS measure are clearly linked to clinically relevant symptoms but have also been linked with other aspects of adolescent development. The various emotion regulation factors measured by the DERS were examined with respect to development of identity in adolescence (Jankowski, 2013). Levels of emotional awareness were found to be an important determinant of identity formation. Those who were more emotionally aware reported achieving the highest identity dimension whereas those lower on identity achievement formation were characterized with lower levels of emotional awareness (Jankowski, 2013). Difficulties in realizing goal-oriented behaviours and control over impulses were also associated with lower identity achievement status. This study provides preliminary support for the role of emotion regulation skills in important developmental processes in adolescence which in turn can affect psychosocial adjustment.

Another study investigated the role of emotion regulation in the association between adjustment/depression and two different functions of language: epistemic (personal sense of confidence in using language to explore and understand inner psychological experiences) and communicative (personal perceptions of the effectiveness of language in sharing psychological experiences) (Simsek & Cerci, 2013). The researchers posited that a gap exists between inner psychological experiences and corresponding language that represents inner experiences. This gap is a likely contributor to mental health and can be used to diagnose mental health problems. The researchers further proposed that processes through which language contributes to mental health could possibly be via emotion regulation. Using structural equation modelling, emotion regulation was found to partially mediate the relationship between language gap and adjustment. Emotion regulation and adjustment fully mediated the association between language gap and depression and adjustment mediated the relationship between emotion regulation and depression. This study provides evidence for the contribution of underlying processes such as the gap between personal experiences and language usage, emotion regulation, and adjustment,

as contributors to mental health problems (Simsek & Cerci, 2013). This is important in the context of the current study because RFT, the theory of language and cognition underlying the PF construct, suggests that language processes influences inner psychological experiences.

Similarly, the role of language and cognition has been examined in other constructs in other ways. Language and cognition in the form of verbal behaviour, as reflected in the PF construct, has been investigated along with difficulties in emotion regulation as underlying processes affecting the inability to identify and describe emotional states in words (i.e. alexithymia) (Venta et al., 2012). An inpatient adolescent group with higher levels of alexithymia reported higher levels of difficulties in emotion regulation and lower levels of psychological flexibility (Venta et al., 2012). In addition, lower levels of psychological flexibility partially mediated the relationship between alexithymia and difficulties in emotion regulation. The findings from this study suggest that in addition to having difficulties regulating emotions and the inability to identify and describe emotions, the adolescents were also unwilling to tolerate the aversive nature of the emotions they were experiencing (Venta et al., 2012).

In another study, the association between borderline personality features and both difficulties in emotion regulation and PF in 208 inpatient psychiatric adolescents were examined (Schramm, Venta, & Sharp, 2013). Borderline personality features were positively linked with difficulties in emotion regulation and negatively linked with PF. PF added significant incremental validity and contributed independently to borderline personality features above and beyond difficulties in emotion regulation. Psychological flexibility seems to capture other processes that are not present in the DERS.

In conclusion, increasing evidence for the utility of the DERS as a measure of emotion dysregulation has demonstrated utility in adolescents. Different dimensions of difficulties in emotion regulation are associated with clinically relevant symptoms and with specific developmental measures in adolescence. The studies reviewed above highlight the need to target emotion regulation skills in treatment, especially PF. Although there is conceptual

similarity between the DERS and PF, PF has made a significant and independent contribution to our understanding of emotionally-related problems in adolescents and has been shown to have incremental validity over the DERS. The PF construct includes features of emotion regulation, but is also a broader construct in the contribution towards emotionally-related psychological symptoms (Chapman, Dixon-Gordon, & Walters, 2011). Emotion regulation focuses specifically on mechanisms – whether deliberate or automatic - that have the goal of changing or moderating the experience of emotions. PF extends to include the regulation of an individual's experience of many other private events, such as thoughts, sensations, images, and memories in connection with emotions.

3.4 Summary and Conclusion

In this section, PF has been shown to be associated with a broad range of psychological symptoms, psychological distress variables, and other psychological vulnerability/risk factors. In intervention studies, PF has been shown to be a mechanism of change for a range of psychological symptoms (Hayes et al., 2006; Ruiz, 2010). The evidence also shows that PF plays a role in the relationship between psychological symptoms and negative outcomes. In these studies, psychological symptoms have been shown to potentially lead to psychopathology or increases in psychopathology via decreases in PF. Furthermore, PF acts as a psychological vulnerability for emotionally-and-socially-related problems. PF is similar to other coping and emotion regulation strategies but is a different, broader construct, explaining additional variance in studies when it was examined with other constructs (Kashdan et al., 2006a). In adults, PF has been found to mediate the relationship between psychological symptoms and various forms of coping by suppression and avoidance. The body of evidence suggests that individuals may engage in many forms of coping and/or emotion regulation in an avoidant and suppressive fashion that may bring relief to them in the short term but may actually continue to become detrimental in the longer term (Boulanger et al., 2010). Many of these forms of coping by suppression and avoidance have been implicated in studies associating coping and emotion regulation strategies with psychological symptoms in adolescents. For example, research

examining the AFQ-Y and DERS in adolescents has shown that both constructs are associated with psychological symptoms. Furthermore, the studies reviewed above showed that there is evidence for similarity between PF and difficulties with emotion regulation. The similarity between PF and difficulties in emotion regulation shows that PF can be viewed as an emotion regulation variable but PF offers additional unique variance in predicting psychological symptom severity (Chapman et al., 2011). It is possible that the unique variance in the PF construct represents the willingness to be open to experiences that are linked with effective action in realizing values or goals (Boulanger et al., 2010).

At present, studies that examined the PF construct have mainly been cross-sectional in nature and therefore what is known is that PF is a correlate of psychological disorders, other forms of coping and emotion regulation constructs and certain cognitive vulnerabilities. Based on the RFT literature, the ability for language and cognition commences at an early age but it is still unclear as to when these language and cognitive abilities can develop into maladaptive forms of coping or contribute to the dysregulation of emotions. Longitudinal studies are needed to provide a better understanding of how the PF construct is related to emotional and social well-being. Adolescence is a crucial developmental period in which intensive emotions are experienced and disruptions in social networks are also likely to be experienced. It seems that the adolescence period provides a good opportunity to explore the temporal sequencing between PF and emotional and social well-being over time. The next chapter provides an overview of the emotional and social developments in adolescence and how these developments can lead to the links between emotional well-being and mental health and social well-being and mental health. Further, the connections between specific emotions and PF are considered followed by the connection between perceived social support and PF.

Chapter 4: Emotional and Social Well-being as Markers of Mental Health Risk in Adolescents

Emotional well-being and social well-being are equally important aspects of development in adolescents. In this section, emotional well-being in adolescents will be considered first, followed by social well-being in adolescents. However, before emotional and social well-being are considered, unique biological and social changes that occur during adolescence are described in order to provide a perspective of the adolescent emotional and social context.

The research undertaken seeks to target a vulnerable period in adolescence and identify common processes that contribute to psychological difficulties. Adolescence is most often marked as a period of transition between childhood and adulthood. Adolescence typically commences from the age of 11 until the age of 19 and the length of the adolescence period is typically organized as early adolescence (ages 11-13), mid-adolescence (ages 14-16), and late adolescence (ages 17-19). Adolescence is a crucial period for understanding how the developing brain interacts with the environment to produce behaviours and attitudes in the service of attaining increasing independence from parents and family, developing relationships with peers including the opposite gender, fulfilling academic requirements, planning for an occupation, and working out a set of values that would guide them as they move into adult roles. Numerous developmental interactions take place during adolescence, highlighting the bidirectional nature of genes, hormones, and neural structures with environmental influences (Dahl, 2004; Susman & Rogol, 2004). Changes that occur due to the interaction between biology and environment often have an effect on emotional, cognitive, and social systems.

Accumulated research has shown that during adolescence, it is normal for adolescents to engage in increased risk-taking and reward-seeking behaviours (the tendency to seek out novel and stimulating experiences that are potentially harmful) with peaks seen in mid-adolescence and declines observed in early adulthood (Braams et al., 2015; Col-lado et al.,

2014; Hale et al., 2014; Romer et al., 2014). At the same time, research indicates that distinct and complex self-regulatory mechanisms are being developed, such as impulse control and delayed gratification, as adolescents become exposed to different situations and influences. In addition, research also indicates that the consumption of alcohol commences in early/mid-adolescence with typical initiation at the age of 15 years possibly due to environmental factors (Masten, Faden, Zucker, & Spear, 2009). Research indicates that some environmental factors that influence drunkenness in mid-adolescence include family variables such as parental acceptance, father drunkenness, and low parental support and peer variables such as peer support, acceptance, and drunkenness (Heismisdottir, Vilhjalmsdottir, Kristjansdottir, & Meyrowitsch, 2010). A similar influence of peers during mid-adolescence was observed for smoking (Mercken, Candel, Willems, & de Vries, 2009). Research suggests that as adolescents attempt to gain a balance between their impulses and risk-taking tendencies, a propensity for substance use can develop (Masten, Faden, Zucker, & Spear, 2009). If adolescents start indulging in higher levels of alcohol consumption and smoking during this period, then it can adversely influence their reward sensitivity levels and social and emotional behaviour. The number and kinds of influences can be varied and this can be a concern especially during mid-adolescence. Taken together, mid-adolescence is a period in which rapid changes are occurring internally and in the external environment and these are likely to influence cognitive and socio-emotional development. The greatest challenge for adolescents is to be able to develop appropriate self-regulatory skills in the face of typical developmental challenges.

An attempt to understand adolescent behaviour involves taking a look at the context of the behaviour including other factors that have an effect on the pervasiveness of that context. The adolescent context is unique as it involves the transitional period from late childhood to early adulthood and the beginning of reproductive maturity in humans. Adolescents typically experience greater stress and instability in emotional and social experiences as a result of this transition (Larson, Moneta, Richards, & Wilson, 2002). Adolescents are known to be influenced by their childhood environment (eg. family socialization) and their own individual

constitution that involve temperament and genetics. Developmental changes at the biological and social levels also have an effect on adolescents. The accentuation hypothesis asserts that when stress is encountered during this transition period, behavioural problems that had been observed in childhood can also be observed in adolescence (Caspi & Moffitt, 1991; Laceulle et al., 2014). In other words, a continuity in personality characteristics or the way response systems have been shaped and formed in childhood can be observed in adolescence during this disruptive transition period. Generally, the majority of adolescents will face difficulties as it is implicit in this developmental stage. Nevertheless, the extent to which difficulties are experienced and the degree to which responses become reactionary also depend upon the context. The intensity of problems faced by adolescents, to a large extent, depends upon the availability and perceptions of social support in the form of family, friends, and peers. Those who receive support are better equipped with resources to face challenges in this life stage. Additionally, from a psychosocial perspective, the development of emotions and reactions to emotions occurs within social interactions. This makes the social context an important ground for identifying, understanding, and labelling specific emotions. Social interactions also provide a means to consider when and where certain emotions and their intensities should be expressed. Social interactions and context establish rules for feeling appropriate emotions in particular circumstances. Thus, important changes that occur at the biological and social levels can be viewed as the context for the majority of adolescents.

4.1 Biological and Social Changes in Adolescence

Although certain developmental processes in childhood continue into adolescence, advances in neuropsychological research have shown that development during adolescence is different due to biological changes (Hollenstein & Loughheed, 2013). Structural and functional biological changes influence adolescent behaviour via several mechanisms that include changes at the physical level (e.g., height, weight, secondary sex characteristics etc.), the neurochemical level (e.g. puberty and the pruning of synaptic connections), and at the cognitive functioning level (frontal and parietal regions). On one level, adolescents experience accelerated physical

growth that contributes to enhanced strength and endurance. On another level, pubertal maturation involves fluctuations in hormones, testosterone, and estradiol. Hormonal fluctuations influence the hypothalamic-pituitary-adrenal axes and hypothalamic-pituitary-gonadal axes at different rates and amplitudes at different periods in adolescence and have effects on the balance of neurochemicals in the brain (McCartney et al., 2009). Additionally, rapid cognitive development in the domain of processing speed, prospective memory, and working memory increases cognitive capacity and decision-making abilities. But the disparity between the early maturation of the emotional sub-system (limbic system) versus the late maturation of the cognitive sub-system (prefrontal cortex) renders adolescents susceptible to heightened risk taking behaviour in adolescence particularly during early to mid-adolescence (Giedd et al., 1999; Shaw et al., 2008; Steinberg, 2008).

Adolescent behaviour can be highly sensitive to biological changes. Hormonal changes during puberty have an effect on bodily changes and adolescents become exceedingly self-conscious about their body. Bodily changes are highly scrutinised by peers and become an issue for social comparison in adolescence (Brooks-Gunn & Warren, 1989). For boys, a postpubertal physical form becomes a focus as it is socially desirable (Petersen & Crockett, 1985). Moreover, body-consciousness in today's contemporary culture has evoked body image concerns that may have an effect on eating habits and emotional well-being (Hughes & Gullone, 2011). Put together, structural and functional changes in biology are ubiquitous and inevitable and have an influence on adolescent emotional functioning; however, environmental influences in the form of social and cultural context play a significant role in enacting biological changes with consequences bearing on emotional processes during adolescence (Hollenstein & Loughheed, 2013). Various challenges stemming from emotional processes in childhood coupled with developmental changes in adolescence can either become a basis for the skilful management of emotions or the dysregulation of emotions. Many adolescents learn how to navigate these challenges successfully; however adolescents who lack adaptive strategies in

managing these challenges are particularly at risk of developing psychopathology (Lougheed & Hollenstein, 2012; Silk et al., 2009).

Adolescents also experience considerable changes in social relationships. Changes that have been observed in adolescents are primarily the distancing from parents and the increased movement towards peers for support (Helsen et al., 2000; Hombrados-Mendieta, Gomez-Jacinto, Dominguez-Fuentes, Garcia-Leiva, & Castro-Trave, 2012; Scholte & Van Aken, 2006). Friends and peers provide increasing emotional and informational support in general but girls usually report higher levels of support from friends and peers than boys (Hombrados-Mendieta et al., 2012). Emotional support is provided in the form of affection and time in listening to expressions of feelings while informational support is provided in the form of useful tips and information concerned with typical daily problems and tasks. Peers also become more important as popularity and peer approval become the focus of their social world. As adolescents become more peer-oriented, social contextual cues that guide emotion management decisions are also transformed as peer expectations and prosocial goals become their primary concern (Zeman & Shipman, 1998). Adolescents increasingly become more self-absorbed as they place higher value on self-image and self-presentation (impression management) with concerns about feeling vulnerable (regulating sadness more than anger) (Shipman, Zeman, Nesin, & Fitzgerald, 2003). Moreover, as adolescents are developing a sense of identity and autonomy, they are also redefining their role across different social contexts (e.g. at home and in school) at the same time (Petersen, Kennedy, & Sullivan, 1991). Another contemporary social change for adolescents is the use of social media. Social networking sites are the predominant means of making friends, communicating with peers, and a means of identity exploration. Social networking sites have significant positive and negative impact on the emotional and social well-being of adolescents (Cookingham & Ryan, 2015).

The diverse and considerable biological changes experienced in the physical body, the changes in family relationships, and the increased focus on peers and how they present to their peers creates intense psychological needs in adolescents. Adolescents are constantly adjusting

their self-image to peer expectations, striving to acquire independence, endeavouring to succeed academically, and trying to experience fun and excitement in the midst of it all. In trying to realize psychological needs, adolescents are also coping with emotions and stress. In light of these unique developmental changes, coping processes learned in childhood may also change or become more pronounced in adolescence. For example, adolescents in the 14-16 years age bracket tend to reduce their use of problem-focused coping (e.g. cognitive problem-solving, planning) and switch to using more emotion-focused coping (e.g. distraction, escape) (Zimmer-Gembeck & Skinner, 2011). Additionally, their experience of different emotions and their perceptions of the availability of social support are liable to change during this period. For example, adolescents usually feel more conscious about their body image and how they present to the outside world. Consequently they are also more likely to perceive themselves as inadequate and this may be heightened by a global sense of shame and/or sadness (Angold & Costello, 2006). Given that adolescents increasingly rely on their peers instead of family members for emotional support (Zimmer-Gembeck & Skinner, 2011), it is probable that the experience of emotions and perceived social support will be different in adolescence in comparison to childhood. Adolescents are more likely to manage different emotions in alignment with goals of their peer group. Shifts in perceived social support are also likely, consistent with adolescents' increasing dependence on peers to manage emotions.

4.2 Emotional Well-being and Mental Health

Emotional well-being can be seen as a continuum between momentary emotional states that accumulate and develop into a central tendency or more sustained emotional experience (Larsen, 2009). In other words, there is a continuum between daily experiences of an affective state, such as sadness, that can develop into emotional distress and manifest as depression. Affective experiences can be viewed from an integrative hierarchical model that has three different levels (Tellegen, Watson, & Clark, 1999). The first level consists of the bipolar dimensions of pleasant versus unpleasant (Green, Goldman, & Salovey, 1993). The second level consists of positive and negative affect (Watson & Tellegen, 1985) and the third level

consists of discrete emotions (Frijda, 1986; Smith & Ellsworth, 1985). Robust empirical support has been found for the valence level of emotions. Negative and positive affect are two broad and independent dimensions and have corresponding links with psychological symptoms (Diener & Larsen, 1993; Watson & Tellegen, 1985). However, research is accumulating for the third level consisting of discrete emotions and their individual links with well-being and psychological disorders.

Adolescents typically experience a downward shift that can be explained as increases in negative emotions and decreases in positive states in their daily range of emotions between early and late adolescence (Larson, Moneta, Richards, & Wilson, 2002). In particular, levels of happiness continue their downward shift until greater stability is attained in late adolescence (Larson et al., 2002). Further, in the period between early and late adolescence, stress and adjustment (e.g. self-esteem and problem behaviours) levels have been observed to remain stable, suggesting that there is a tendency for adolescents to experience increasing levels of negative affect and decreasing levels of positive affect regardless of stress levels (Larson et al., 2002; Costa & McCrae, 1990). Additionally, gender differences in negative and positive emotions have also been found to be mixed. In some studies, girls were found to have increased levels of negative affect in comparison to boys (Holsen et al., 2002; Petersen, Sargiani, & Kennedy, 1991) while in another study, both girls and boys were found to experience similar increased levels of negative affect and decreased levels of positive affect (Larson et al., 2002). Although the discrepancies can be attributable to measurement differences, more research is needed to investigate gender differences. The general picture of emotional experiences during adolescence can be quite disconcerting as greater negative emotions are experienced beginning in early adolescence due to developmental stresses and cognitive changes, but they do not necessarily reverse when negative emotions stabilize in late adolescence (Larson & Asmussen, 1991; Larson et al., 2002). A similar phenomena has also been observed with positive emotions. The implication of these studies for mid-adolescents is that even though the downward shift occurs in early adolescence and stabilizes in late adolescence, mid-adolescence

can be the lowest point as negative emotions are possibly at a peak level and positive emotions are possibly at the lowest levels.

4.2.1 The Link between Positive Affect and Negative Affect and Mental Health

From a subjective well-being perspective, positive and negative emotionality is a large component of subjective well-being in addition to life satisfaction (Lucas, Diener, & Suh, 1996). However, positive and negative emotional experiences also contribute to life satisfaction. In particular, the experience of positive emotions is more strongly correlated to life satisfaction than negative emotions and therefore positive experiences are considered an important pathway to experiencing life satisfaction (Kuppens et al., 2008). When viewed from another perspective, subjective well-being can be considered as seeking to promote the experience of positive emotions while minimizing the experience of negative emotions. Emotional distress as expressed in depression can be viewed as the opposite of being in a state of well-being. The experience of more negative emotions and less positive emotions contributes to psychological difficulties.

Watson and colleagues identified that negative and positive affect link well-being with distress. Through a series of studies, the researchers found that high levels of negative affectivity and low levels of positive affectivity had a pervasive influence on physical health and stress, depression and anxiety, and lay on a continuum with a neurotic temperamental predisposition (Chorpita, 2002; Joiner, Catanzaro, & Laurent, 1996; Mineka, Watson, & Clark, 1998; Watson & Clark, 1984; Watson & Pennebaker, 1989; Watson & Walker, 1996). The tripartite model that emerged out of empirical evidence showed that negative affectivity accounted for comorbidity between depression and anxiety. Positive affectivity and physiological arousal accounted for differences between depression and anxiety. This model was supported in children, adolescents, and adults (Chorpita & Daleiden, 2002; Joiner et al., 1996; Mineka et al., 1998).

However, an alternative model built upon the initial tripartite model proposed that fear appeared to be a better construct in the delineation of depression and anxiety. In a clinical

sample, fear was found to distinguish between depression and anxiety better than physiological arousal (Chorpita et al., 1998). The researchers argued that fear captured a wider range of anxiety disorders and that the original tripartite model did not take into account the heterogeneity of anxiety disorders. A modified tripartite model that consisted of negative affect, positive affect, and fear was supported by subsequent research (Muris, Schmidt, Merckelbach, & Schouten, 2001). Correlations depicting the modified tripartite model between fear and depression were in the lower range ($r = .20$), between anxiety and fear in the moderate range ($r = .38$) and between anxiety and depression in the higher range ($r = .64$) (Muris et al., 2001). The finding that fear (as a discrete emotion) was a better alternative than physiological arousal has prompted questions regarding the utility of higher order factors (negative affect and positive affect) in explaining comorbidity between depression and anxiety. Weak correlations were found between negative affect and specific anxiety disorders in normal and clinical populations in children, adolescents, and adults. This supports the view that lower order discrete emotions may be more useful in explaining differences among anxiety disorders (Chorpita, Plummer, & Moffitt, 2000; Watson et al., 2005). Fear has been found to better explain specific anxiety disorders (e.g. social phobia) while physiological arousal is more of a characteristic of panic disorders (Brown, Chorpita, & Barlow, 1998; Mineka et al., 1998). Moreover, positive affect, originally considered as a differentiating factor between depression and anxiety, has been implicated as a stronger predictor of social phobia (Brown et al., 1998; Chorpita et al., 2000) and unspecified anxiety disorders (Jacques & Mash, 2004) in adolescent clinical populations. Together these studies suggest that specific emotions may be important in explaining specific mental health problems that seem to escape the broader dimensional approach of emotions.

Other specific negative emotions can be differentiated based on their meaning for an individual. For instance, the experience of sadness while grieving for the loss of a significant person is different from the experience of shame which involves a tendency to consider oneself as globally unworthy. Positive affect also has different facets such as joy, interest, and activation, which may have unique relationships with coping and self-regulation (Egloff,

Schmukle, Burns, Kohlmann, & Hock, 2003). Furthermore, research on specific dominant and nondominant emotions and their corresponding effects on coping dispositions also contribute to the limitations of valence states (Egloff & Krohne, 1996). For example, a provoked dominant emotion carries more intensity than nondominant emotions (Egloff & Krohne, 1996). Given the limitations at the level of the valence states (i.e. positive and negative affect), it is worth examining lower order discrete emotions as specific emotions may have different effects on cognition (Frijda, 1986; Roseman, 1984; Smith & Ellsworth, 1985) and physiology (LeDoux, 1992; Levenson et al., 1990; Panksepp, 1993) beyond valence and arousal states.

4.2.2 Specific Emotions and Mental Health in Adolescents

Research on the link between individual discrete emotions and well-being/psychopathology has been accumulating. Emotional development theories emphasize the embeddedness of the experience of emotions in socialization processes in the family and according to prescribed rules of expression at the societal/cultural level (Campos et al., 1989; Saarni, 1990). Children learn at a very young age that the expression of negative affect in comparison to positive affect can result in unfavourable responses from others with the consequence of reduced comforting, help, and support (Coyne, 1976; Malatesta & Haviland, 1982). Moreover, in the context of specific emotions, the profiles of different negative and positive emotion differed in the comparison between depressed and nondepressed youth (Carey, Finch, & Carey, 1991). Each discrete emotion, irrespective of negative or positive valence, influences mental health and well-being in different and independent ways even though they may be associated.

Fear plays a large role in the etiology of anxiety and anxiety disorders. Fear and anxiety have separate factor structures but they are highly interlinked (Chorpita et al., 1998). The pathology of fear and anxiety in youth has received much attention in the past decade due to the high prevalence of anxiety disorders. Research on the pathogenesis of anxiety disorders has revealed that fear and anxiety cannot be discriminated as anxiety can shift into a fear response and can intensify into a panic or phobia when exposed to the stimuli or situation. The

relationship between fear and other psychological disorders such as anxiety and depression have been shown to be distinct but correlated as a group of negative emotions (Muris et al., 2001). Moreover, from a developmental psychopathology perspective, a continuum exists between normal fear and anxiety disorders which can be attributed to shifts in cognitive development during the teenage years (Cicchetti & Cohen, 1995).

Sadness in adolescents has mainly been examined as dysphoria and depression (Kovacs & Yaroslavsky, 2014). Persistent sadness acts as a vulnerability factor that may eventually lead to depression (Wakefield, Schmitz, & Baer, 2010). Moreover, prior research has also identified sadness as being present in depression rather than as depression being present in sadness (Leventhal, 2008). Research in child and adolescent depression increasingly shows the detrimental effects of familial depression on depressed and never-depressed adolescents through displays of dysphoric experiences, the inability to repair mood, and impaired mood repair mechanisms (Kovacs & Yaroslavsky, 2014). Adolescents who experience sadness and view their difficult circumstances as being uncontrollable are also more likely to use alcohol and other drugs regularly and find it more difficult to access sustaining and reliable social supports (MacLean, Kutin, Best, Bruun, & Green, 2014). Sadness prompts certain coping responses that can lead individuals down a pathway where it can intensify and become increasingly difficult to return to a state of normalcy. More research is therefore required to identify risk factors associated with sadness and the manner in which sadness is regulated.

Early research on hostility was mainly associated with physical health outcomes and in particular, coronary heart disease (CHD) (Miller, Smith, Turner, Guijarro, & Hallet, 1996). Although children are rarely known to suffer from CHD, research evidence suggests that atherosclerosis begins in adolescence and that a pattern of hostile-anger pattern possibly begins in childhood and becomes more pronounced in adolescence (Matthews & Woodall, 1988). The interpersonal component of the psychosocial vulnerability model, in particular perceptions of low social support, has often been used to explain ill health in highly hostile individuals with males exhibiting more overt verbal and behavioural hostility than females (Hart, 1999).

Similarly, there is a growing body of literature linking hostility with stress and depression in adolescence (Felsten, 1996; Weiss et al., 2005). Hostile attributions are also known to predict aggressive behaviour (Burks, Laird, Dodge, Pettit, & Bates, 1999; Godleski & Ostrov, 2010; Orobio de Castro, Veerman, Koops, Bosch, & Monshouwer, 2002). Genetic factors play a role – albeit a small role - in the heritability of hostile/anger profile (Cates, Houston, Vavak, Crawford, & Uttley, 1993; Smith, McGonigle, Turner, Ford, & Slattery, 1991). Etiological correlates of hostility have been clearly established, but little is known about coping strategies used by hostile individuals and whether hostility has more specific markers of risk.

Proneness to shame can become exacerbated when shame is experienced continually and can lead to a wide range of psychological problems. In adults, shame has been associated with a variety of anxiety disorders, depression, anger, substance abuse, somatization disorders, and eating disorders (Andrews, Qian, & Valentine, 2002; Sanftner, Barlow, Marschall, & Tangney, 1995; Tangney, Burggraf, & Wagner, 1995; Tangney, Wagner, Fletcher, & Gramzow, 1992). Other psychological symptoms have also been associated with shame such as the fear of negative social evaluation, externalizing blame, and feelings of inferiority. In children between 5 and 13 years, shame-proneness has been broadly associated with internalizing and externalizing disorders, suggesting that shame-proneness underlies a range of psychological disorders (Ferguson, Stegge, Eyre, Vollmer, & Ashbaker, 2000; Ferguson, Stegge, Miller, & Olsen, 1999). Results from longitudinal studies indicate that adolescents who tend to experience increases in shame and decreases in the experience of guilt are prone to experience depression and to become involved in delinquent behaviour in late adolescence (Stuewig & McCloskey, 2005; Tilghman-Osborne, Cole, Felton, & Ciesla, 2008). In another longitudinal study among early adolescents, differences between guilt and shame were evaluated on prosocial, withdrawn, and aggressive behaviours (Roos, Hodges, & Salmivalli, 2014). The tendency for guilt-proneness contributed to reparative actions accompanied by the likelihood of remaining disengaged in maladaptive behaviours while shame-proneness tended towards less prosocial behaviour.

The role of positive emotions has mainly been examined in relation to its pleasant characteristics and its relationship with well-being. The role of positive affect in psychopathology has been neglected despite the viewpoint that deficits or excesses in positive emotions can also be maladaptive (Gilbert, 2012). Due to a lack of research in adolescents there is a need to rely on data from adult models of the dysregulation of positive emotions. Support for the dysregulation of positive emotions can be applied to some specific disorders such as major depression, social anxiety, bipolar disorder, externalizing disorders, and eating disorders (Gilbert, 2012). The dysregulation of positive emotions is marked by deficits in or low levels of the experience of positive emotions, imbalances between the experience of positive and negative emotions, the inability to differentiate between high-approach motivation and low-approach motivation emotions, or elevated reward-seeking and sensation-seeking tendencies (Gilbert, 2012). Adolescents typically report experiencing more negative affect in comparison to positive affect as is evidenced by a linear increase in negative affect and a substantial decline in positive affect as adolescence progresses (Henker et al., 2002; Silk et al., 2009). The risk of psychopathology increases in adolescence when the ratio of negative to positive emotions experienced become greatly unbalanced (Fussner, Luebke, & Bell, 2015). In addition, adolescents experience greater intensity and variability in emotions on a daily basis and extreme feelings of both negative and positive emotions. Adolescents also react quicker to emotional stimuli than children and adults and this explains the accelerated responding in emotional situations, especially when in conflict with parents and in risk-taking activities during this age period (Tottenham, Hare, & Casey, 2011). Research is increasingly showing that apart from the contribution of high levels of negative affect on internalizing disorders (e.g. anxiety, depression), low levels of positive affect also contribute to increases in psychopathology (Gilbert, 2012; Neumann, van Lier, Frijns, Meeus, & Koot, 2011).

4.2.3 Specific Emotions and Gender Differences

Gender differences in the intensity and variability in each discrete emotion have mainly been found to be mixed with no consensus in either direction. However, when discrete

emotions are scrutinized in specific contexts, gender differences appear and are more consistently dependent on context. For example, girls are known to be more prone to shame than boys due to physical changes and this has an effect on their cognitions about the global self in relation to perceptions of body image (Reimer, 1996; Rosenblum & Lewis, 1999). Girls tend to attribute negative evaluations in areas of achievement and global self-worth during these physical changes which indicates shame proneness (Eberhart, Shih, Hammen, & Brennan, 2006). Similarly, hostile males tend to exhibit more overt verbal and behavioural hostility than females (Hart, 1999). In the case of sadness, boys tend to express and exhibit less sadness when compared to girls (Zeman & Garber, 1996). Girls generally report being more fearful than boys on general measures of fear (Muris & Rijke, 2011; Ollendick, King, & Muris, 2002) and this gender imbalance can also be seen in those who report higher levels of general and specific anxiety (Zahn-Waxler, Shirtcliff, & Marceau, 2008). Gender role orientation has been shown to play a role in the experience of the intensity of fear in children (Ginsburg & Silverman, 2000; Muris, Meesters, & Knoop, 2005). The display of fear in girls socialized with feminine roles is more acceptable whereas in boys socialized with masculine roles, the display of fear is not very well tolerated as they are expected to be courageous and brave (Ollendick, Yang, Dong, Xia, & Lin, 1995). With respect to joy, gender differences are not very prominent, although in a daily diary report of emotion and mood study, adolescent girls reported lower levels of happiness than boys (Henker et al., 2002). Taken together, these findings suggest the need to consider gender differences in the experience of specific emotions.

4.3 Social Well-being and Mental Health in Adolescents

A sense of social well-being is experienced when people perceive that they have an adequate number of people they can rely on and express satisfaction with these relationships. The protective aspect of social support can be considered to contribute to resilience in young people (Pinkerton & Dolan, 2007). The link between positive perceptions of social support and physical and mental well-being are well established and reflects a range of social and interpersonal competencies along with stable and distinct patterns of perceptions of social

relationships (Geckova, Van Dijk, Stewart, Groothoff, & Post, 2003; Kyngas, 2004; Martire, Lustig, Schulz, Miller, & Helgeson, 2004; I. Sarason, Sarason, & Pierce, 1990). Adolescents who perceive strong social support are considered to cope better with major and minor life changes whereas those who perceive little or no social support are more vulnerable to negative life reactions to life changing experiences (Bal, Crombez, Oost, & Debourdeaudhuij, 2003; Herman-Stahl & Petersen, 1996; Murberg & Bru, 2004). Research on the link between social well-being and mental health support the view that higher levels of perceived social support are related to lower levels of distress, more moderate reactions to negative events and stress, and lower levels of depression (Cornwell, 2003; Frey & Rothlisberger, 1996; Galaif, Sussman, Chou, & Wills, 2003; Garnefski & Doets, 2000; Kaltiala-Heino, Rimpela, Rantanen, & Laippala, 2001; Plesko, 2004). However, considerable fluctuations in social support over time can contribute to increasing levels of depression (Cornwell, 2003; Needham, 2008). Low perceptions of social support are associated with emotional difficulties and problem behaviours in children and adolescents (Demaray & Malecki, 2002). A lack of positive perceptions of social support is also indicated in hostile-prone individuals (Vranceanu, Gallo, & Bogart, 2006).

In adolescents, PSS and social support seeking have been categorized as separate protective components from other protective factors (e.g. positive personality traits, self-esteem, self-efficacy, and functional coping styles) and vulnerability factors (e.g. neuroticism and dysfunctional coping and emotion regulation strategies) (Muris, Mayer, Reinders, & Wesenhagen, 2011). This component of “social connectedness,” included the personality trait of agreeableness, suggesting that the social support recipient is more likely to garner support with an agreeable personality. PSS often serves as a barometer of self-worth and a sense of being cared for which produces a sense of stability and predictability in coping with life and a more permanent feeling of psychological health (Cobb, 1976; Cohen & Wills, 1985; Compas et al., 1986). A sense of well-being is experienced when individuals assign more positive attributes and less negative attributes to themselves (B. Sarason et al., 1991). Individuals who perceive high social support are also more interpersonally effective and this is reflected in how

they confront challenges and solve problems which eventually lead to an enhancement of their coping repertoire (I. Sarason & Sarason, 1986; I. Sarason, Sarason, Keefe, Hayes, & Shearin, 1986). In other words, supportive others are given the opportunity to render support to individuals with high perceived social support and in turn, the expectation of receiving support is continuously reinforced (Pierce, Sarason, & Sarason, 1992).

High parental support predicts better adjusted and less distressed children (Holahan, Valentiner, & Moos, 1995). Even in the case of abused children, parental support contributed to less intense behavioural difficulties (Tremblay, LeMarquand, & Vitaro, 1999). Females were less likely to engage in violent behaviours despite being exposed to violent friends and adults when they perceived support from at least one parent (Connell, Spencer, & Aber, 1994; Helsen et al., 2000; Zimmerman, Steinman, & Rowe, 1998). Adolescents who perceive low levels of social support are at a higher risk of psychological problems (Helsen et al., 2000; Kinard, 1995; Spaccarelli & Fuchs, 1997). In a comparison of the causes of severe to less severe stress levels, sexually abused adolescents used less social support seeking strategies and more avoidance strategies than adolescents who encountered less severe causes of stress (Bal et al., 2003; Spaccarelli, 1994). Adolescents with low PSS may avoid seeking support in the fear that help may not be forthcoming or they may rely on peers for support which can actually contribute to an increased risk of poor adjustment (Feiring, Taska, & Lewis, 1998).

The buffering effect model of social support suggests that social support intervenes between the stressful event and psychological well-being by influencing cognitive evaluations or by moderating the person's reaction (Cohen & Wills, 1985; Frey & Rothlisberger, 1996). The buffering effect model is considered applicable in those who suffer relatively mild stress or physical ailments than those who suffer more severe stress (e.g., sexual abuse) (Bal et al., 2003; DiMatteo, 2004). PSS has also been shown to moderate the relationship between daily negative events and daily well-being in college students (Nezlek & Allen, 2006).

Some individuals manage stressful life events better than others by using their family and peers for support. Positive social support is linked with well-being. Social support

instability or decreases in social support can have deleterious effects during adolescence (Brausch & Gutierrez, 2010). Social support decay occurs when increasingly detached feelings from usual supports (e.g. parents or grandparents) take place over time (Cornwell, 2003). Eventually, mental health becomes compromised due to the erosion of self-esteem and feelings of non-acceptance from others (Marshall, Parker, Ciarrochi, & Heaven, 2014). Decreases in social support over time can result in chronic stress and that can eventually lead to psychological problems, in particular depression. Adolescents who experience support decay have been found to report higher levels of depression than those who perceive stable or increased levels of social support (Cornwell, 2003). The implication of these findings is that the effects of support decay are greater in magnitude than the stability or growth in support. To put the implications in practical terms according to Cornwell (2003), to lower or deny social support to the extent that will make an adolescent depressed is far easier than it is to improve an adolescent who is already experiencing depression by providing additional social support. Low levels of positive perceptions of social support have been found to be negatively related to other forms of well-being. For example, low PSS leads to increases in unhealthy lifestyles and life dissatisfaction (Allgower, Wardle, & Steptoe, 2001; Thorsteinsson & Brown, 2009; Vermeulen & Mustard, 2000). Currently, there is a lack of understanding of factors that influence decays in PSS.

The ongoing receipt of social support is an essential ingredient in maintaining a sense of well-being (Cornwell, 2003). In adolescence, the central position of the social network is occupied by parents due to the high frequency of contact. But friends become increasingly important in mid-adolescence (Helsen et al., 2000). Adolescents who reported lower levels of parental PSS and higher levels of peer PSS also had higher levels of emotional problems (Helsen et al., 2000). Girls are usually considered to have a larger support network due to the demand for more emotional support when compared to boys but gender differences in PSS have not been prominent (Frey & Rothlisberger, 1996; Helsen et al., 2000). Boys generally receive less support from peers in terms of tangible support (Frey & Rothlisberger, 1996). Overall,

perceived parental support has been shown to have positive outcomes among adolescent beyond gender and adversity. Although support is available for the majority of adolescents, disruptions in social support may still occur.

4.4 Emotional and Social Well-being and Psychological Flexibility

4.4.1 Specific Emotions and Psychological Flexibility in Adolescents

Several studies have started examining the relationship between emotion regulation strategies and specific emotions. Zimmerman and Iwanski (2014) have shown that use of emotion regulation strategies depend upon the intensity and quality of experience of specific emotions. In a sample of low risk participants from the age of 11 to 50 years ($N = 1,305$), emotion regulation strategies used depended on specific emotions such as sadness, fear, and anger (Zimmerman & Iwanski, 2014). In general, those who experienced sadness used more of passivity, avoidance, and social support seeking strategies while those who experienced fear used more of expressive suppression and rumination strategies. Those who experienced anger were more likely to use dysregulated and dysfunctional rumination strategies. Additionally, the researchers found that emotion regulation develops through the experience of specific emotions rather than a general development of emotion regulation strategies. However, only the adaptive emotion regulation strategies and social support seeking approaches were considered more general emotion regulation strategies (Zimmerman & Iwanski, 2014). Moreover, declines in adaptive emotion regulation strategies were observed for sadness and anger from early adolescence to mid-adolescence and an increase in the use of expressive suppression for fear was found from early adolescence to adulthood. Similarly, another study has shown that the development of emotion regulation and its use have been shown to vary between anger, fear, and sadness in children and adolescents based on appropriateness of expression in relation to socially-related goals (Zeman & Shipman, 1997). In these studies, the researchers have brought to light that specific emotions are important in determining the development of emotion regulation strategies during adolescence and emerging adulthood but it is still unclear as to how individual differences in emotion regulation can act as a vulnerability. Moreover, the utility of

investigating individual emotions can also be questioned when it is considered from the perspective of how it can inform or enhance our knowledge of the individual effects of emotions on negative psychological outcomes such as anxiety and depression. An example of a longitudinal study that investigated specific emotions and its contribution in anxiety and depressive symptoms is presented below.

In a one-year longitudinal study in adolescents, the contribution of levels and variability of different emotions (happiness, anger, anxiety, and sadness) were found to be non-specific in depressive and anxiety symptoms (Neumann et al., 2011). In the same study however, the emotion dynamics were more specific in contributing to the development of aggressive behaviour as they included only negative emotions. In this study, only levels of and variability in emotional dynamics were used to predict anxiety symptoms, depressive symptoms, and aggressive behaviours whereas emotion regulation strategies were not assessed. In light of the studies described in the preceding paragraph and this longitudinal study, it can be said that at present, due to the paucity of studies, more definitive conclusions about the relationship between emotion regulation strategies and specific emotions is premature. Some of the unanswered questions were considered in the current study.

As described in the preceding chapter, PF is increasingly being seen as a mindful ER variable and as a psychological vulnerability. High PF is considered as ER processes that contribute to adaptive outcomes while low PF contributes to maladaptive outcomes. Individual differences between basic emotions such as fear, sadness, and hostility in relation to PF are likely to be different. Moreover, the reciprocal influence of PF in relation to each emotion is likely to provide an indication of how PF acts as a psychological vulnerability and whether differences in the reciprocal relationships will confirm whether specific emotions are important for determining when ER strategies are used. For example, the relationship between fear and PF when compared to sadness and PF is likely to differ with respect to how processes in the PF construct are used in order to regulate these emotions. As described in the above study (Zimmerman & Iwanski, 2014), those who experience fear are more likely to use expressive

suppression strategies while those who experience sadness are more prone to use passive avoidance strategies. Similarly, the difference between fear and sadness in relation to PF is also expected to be different in terms of when PF exerts its influence in the emotion generation process model but these differences are difficult to predict in advance. The same difference can be expected in the relationship between hostility and PF.

Hostility is widely implicated in the relationship between social adjustment and psychological symptoms. Although hostility and anger/aggression are often used interchangeably, there are differences between them. Hostility consists of a series of hostile attribution patterns and action tendencies as suggested by the social information processing model (SIP; Crick & Dodge, 1994) while emotion and behaviour are more relevant in anger and aggression (Smith, 1992). Based on the SIP, hostility can be dysregulated in children and adolescents when confronted with ambiguous social situations. They attend to cues that have been selectively encoded to include hostile intentions, attribute hostile intentions to others, select aggressive or revenge goals, engender aggressive responses, tend to select aggressive responses as these are evaluated more favourably, presume affirmative outcomes from aggressive behaviour, and indulge in self-confidence when executing aggressive actions (Crick & Dodge, 1994). Furthermore, the acquisition and maintenance of trait-like aggressive behaviour appears to be fed by hostile attributions that originate from the family environment (Huesmann, 1998).

According to Huesmann's (1998) observations, children are capable of learning complex behaviours that are encoded in memory and are retrieved during social interactions. Cognitive scripts encoded into memory from previous experiences and exposure to aggressive behaviours tend to become resistant to change and can persist in adulthood. The development and persistence of hostile attributions are consistent with the RFT conceptualization of the development of cognitions based on observational learning. Cognitive scripts are learned through respondent and operant conditioning of language and cognition. For example, when a child is repeatedly exposed to aggressive behaviour, they have essentially observed a series of

relational operants from which meaning and action tendencies have been abstracted (D. Barnes-Holmes et al., 2001). Hostile attributions can be said to be a result of this learning process in which verbal and behavioural items are matched according to the consequences observed. The child observes contingencies of behaviour(s) and begins to relate it with many other events in the observed aggressive interaction(s) and this kind of learning tends to influence how they respond emotionally in future social interactions (D. Barnes-Holmes et al., 2001). From an RFT perspective, hostile attributions can be dysregulated through processes inherent in cognitive fusion and experiential avoidance. In a study examining the AAQ-II and a range of psychological symptom measures, the correlation between the AAQ-II and hostility was .58 (Gloster et al., 2011). Aggressive behaviours in children and adolescents have often been observed in those that have a tendency for delinquency and therefore it has been suggested that mindfulness interventions are better placed at altering the relationship between the individuals' context and their thinking rather than seeking to change thinking in order to change behaviour (Montgomery, Kim, Springer, & Learman, 2013). Given PF is a mindful ER variable, enhancing PF in children and adolescents with aggressive behaviours is likely to counteract hostile attributions.

Besides the basic emotions, self-conscious emotions, such as guilt and shame, have also become important emotions for study in adolescence. Self-conscious emotions differ from basic emotions in that they require more advanced cognitive capacities for self-reflection and self-awareness (Tracy & Robins, 2004). Experiences of shame may trigger self-evaluative processes indicating that an individual may be engaging in a certain kind of self-awareness. For example, an individual may be evaluating the discrepancy between the ideal self and the failed attempt to live up to a desired self-representation. In other words, shame is an emotion that is highly associated with a conceptualized view of the self. The conceptualized self is a verbal construction of the self that contains a history of descriptive and evaluative relational networks about the self (Y. Barnes-Holmes, Barnes-Holmes, Roche, & Smeets, 2001). From an RFT perspective, a conceptualized self is learned in childhood when language is acquired. A

conceptualized self emerges when children are taught how to name, categorize, and evaluate through language. Eventually, a narrative surrounding a conceptualized self is formed and strong emotions can be evoked when inconsistencies in the narrative are seen as threatening (Hayes et al., 2012). According to the PF model, an attachment to a conceptualized self is most likely an indication of being fused with aspects of the self that includes emotions such as shame and guilt. Although self-conscious emotions have a useful purpose in deterring undesirable behaviours in societies and communities, they are likely to become aversive when fused with a dysfunctional conceptualized self. This can become problematic as the desire to maintain a consistent narrative of a conceptualized self becomes an ongoing pursuit. For example, feelings of shame experienced when incompetent behaviour is displayed in one area of life can become a belief that one is globally incompetent. In this way, fusion with the belief that one is incompetent can potentially add to an existing view of a conceptualized self and become globally pervasive in how one conducts his/her life. Shame can become internalized and an individual can feel flawed at a fundamental level (Harper, 2011).

It is likely that the relationship between shame and PF is linked by how an individual conceptualizes the self (Hayes et al., 2012). An individual can have high levels of cognitive fusion (low PF) with automatic self-critical and self-judgmental statements pertaining to shame-proneness. Automatic statements of self-invalidation are often not processed or not allowed in the periphery of awareness due to its association with a history of pain and therefore one engages in experiential avoidance. By nature, shame acts as a barometer for socially desirable behaviours and promotes the capacity for self-reflection and self-evaluation but the same function of shame can become dysfunctional when self-evaluations are focused on discrepancies between the real self and ideal self. An increased focus on such kinds of self-evaluations often amplifies the intensity and aversiveness of an emotion and can restrict PF (Hayes et al., 2012).

In a longitudinal study, avoidant-coping fully mediated the relationship between shame proneness and depressive symptoms in adolescents (De Rubeis & Hollenstein, 2009). Although shame is linked with many psychological problems, some adolescents can manage the

experience of shame better than others. At present, research on shame proneness and the regulation of shame in adolescents is limited and mixed. There is a possibility that higher levels of PF may influence lower levels of shame but when shame is internalized, there is also a possibility that high levels of shame may adversely influence PF. The current study will seek to clarify the relationship between shame and PF.

Apart from negative emotions, positive emotions also play an important role in well-being. Although there is clear evidence that positive and negative affect are two separate factors, some research lines of enquiry suggest that the regulation of positive emotions is connected with the regulation of negative emotions. For example, when people are rigidly attending to their anxious thoughts and feelings, they have reduced cognitive resources in the form of attention to spare towards recognizing reward cues in their immediate environment (Gross & John, 2003). In other words, when negative emotions are being experienced, the attempt to suppress or control negative emotions extends to the suppression of positive emotions as well. Research evidence is accumulating that this occurs for some psychological disorders. In the case of social anxiety disorder (SAD), diminished positive emotional experiences have been the distinguishing factor between SAD and other anxiety disorders (Brown, 2007). In a study comparing people with SAD and healthy individuals, people with SAD maintained low levels of positive emotions and relied on experiential avoidance in their daily social interactions (Kashdan et al., 2013). Likewise, similar conclusions have been found for people with functional impairments where social anxiety is regulated through experiential avoidance (Kashdan & Steger, 2006). Although these findings have only been found for one particular psychological disorder, there is reason to believe that positive emotional experiences can be clouded by excessive expenditure of finite self-regulatory resources on regulating negative emotions. Self-regulatory resources that are used for the immediate temporary escape from emotions experienced as aversive are usually made at the expense of contacting potentially more rewarding long-term goals that are attached to achieving a sense of well-being and balance in life (Baumeister & Vohs, 2007). People low in PF have the tendency to use these finite self-

regulatory resources for alleviating temporary feelings of discomfort associated with negative emotions, thus increasing the burden of stress. At present, research on the regulation of positive emotions has mainly been implicated in psychological disorders, however, there is scant information on the relationship between PF and positive emotions in normal populations. Positive emotions by themselves are associated with extraversion, optimism, and sociability. Positive emotions also lead to successful outcomes as suggested by the broaden-and-build model as cognitive and behavioural repertoires align and produce increased flexibility (Fredrickson, 2001; Fredrickson & Levenson, 1998). Although benefits of the frequent experience of positive emotions has been extensively examined (see Lyubomirsky, King, & Diener, 2005 for details), the desire to maintain positive mood can compromise self-regulation in various ways (Aspinwall, 1998) or have a positive effect on self-regulation (Tice, Baumeister, Shmueli, & Muraven, 2007). For example, desired positive mood maintenance can compete with functional aspects when negative emotions emerge. Or, positive mood can help improve self-regulation by counteracting the effects of ego depletion (Tice et al., 2007). Based on evidence from these studies, there is also reason to believe that positive emotions can have an effect on PF, a proposition which will be tested in the proposed research.

4.4.2 Social Well-being and Psychological Flexibility in Adolescents

According to Lazarus and Folkman (1987), when there is a mismatch between perceived social support and the appraisal of stress, then negative outcomes can be expected. The ability to manage stress and maintain wellbeing was examined in a study that investigated social support, problem-focused coping, and avoidance coping in college students using the COPE questionnaire (Carver, Scheier, & Weintraub, 1989; Chao, 2011). High levels of problem-focused coping contributed towards the maintenance of well-being when stress was experienced, whereas well-being was compromised when levels of problem-focused coping were low. Moreover, problem-focused coping mediated the moderating effects of social support between stress and well-being. High avoidant coping was linked with reduced well-being regardless of the level of social support. These findings suggest that avoidant coping can

influence well-being even when there are high perceptions of positive social support. Not only have the findings in this study added to our understanding of the stress, appraisal, and coping conceptual framework (Lazarus & Folkman, 1987) but has also provided preliminary evidence for the association between social support and problem-focused coping and social support and avoidant coping. Similarly, emotional competencies have been found to influence support seeking behaviours, even with high levels of PSS (Ciarrochi et al., 2002; Ciarrochi et al., 2003).

Findings that PF is associated with both suppression and the COPE questionnaire indicate that there may be a relationship between PF and social support. In the longitudinal link between the ERQ (Gross & John, 2003) and social functioning in college students, suppression predicted poorer social connections over a four year time period but was not related to sociometric standing (social standing and likeability) whereas cognitive reappraisal predicted better social connections and sociometric standing (English, John, Srivastava, & Gross, 2012). Similarly, another study was conducted to examine overlaps and distinctions between coping strategies in the COPE questionnaire and PF (Karekla & Panayiotou, 2011). In addition, a quality of life questionnaire was also used as a measure in this study. The AAQ-II was found to be correlated at $r = .50$ with the social subscale of the quality of life questionnaire, whereas the correlation between acceptance (in the COPE questionnaire) and the social subscale of the quality of life questionnaire was $r = .00$ (i.e., no relationship) (Karekla & Panayiotou, 2011). The AAQ-II and emotional support (in the COPE questionnaire) were also significantly correlated ($r = .30$). Evidence from all the studies reviewed above (including studies that have used other avoidant and ER measures) suggest that the potential association between PF and perceptions of social support is worth investigating longitudinally to determine the temporal relationship between the two coping variables.

4.5 Summary and Conclusion

Adolescence is a transitional period between late childhood and early adulthood. Adolescence is a crucial period for understanding how the developing brain interacts with the environment to produce behaviours and attitudes in the service of attaining increasing

independence from parents and family, developing relationships with peers including the opposite gender, fulfilling academic requirements, planning for an occupation, and working out a set of values that would guide them as they move into adult roles. Mid-adolescence is a peak time during adolescence in which adolescents are prone to engage in increased risk-taking and reward-seeking behaviours. At the same time this is also a time in which adolescents learn more refined self-regulatory behaviours. The greatest challenge for adolescents is to be able to develop appropriate self-regulatory skills in the face of typical developmental challenges.

Biological and social changes during adolescence pose as greatest challenges for adolescents. Structural and functional biological changes influence adolescent behaviour via several mechanisms. Social changes in the form of the shift away from parents and towards peers often influence adolescent social relationships. The diverse and considerable biological changes experienced in the physical body, the changes in family relationships, and the increased focus on peers and how they present to their peers creates intense psychological needs in adolescents.

Mental health is linked with both specific emotions and PSS. The studies reviewed above have implications for the roles of emotional and social well-being as risk factors in adolescent mental health. However, specific discrete emotions go beyond positive and negative affect in explaining well-being and psychological symptoms. Emotional responses for each discrete emotion are more varied than just the valence of emotions (Roseman, 2008). Social well-being is strongly influenced by positive perceptions of social support (Pinkerton & Dolan, 2007). Decreases in the positive perceptions of social support can be seen as a risk factor for the development of psychological and physiological symptoms (Cornwell, 2003).

During adolescence, emotional and social well-being can become compromised due to the inability to manage emotional states effectively and the perception that social support is not likely to be available when it is needed. Moreover, the ability to pursue important life goals involves the management and tolerance of a broad range of emotional states and interpersonal relationships. The adaptive regulation of emotions is an important factor in emotional and

social well-being. PF is likely to play a role in the successful management of emotional states and in positive perceptions of social support in adolescents.

Aims

The aim of the present study was to (1) examine the longitudinal relationship between psychological flexibility, a behavioural mindfulness and acceptance-based ER variable, and discrete emotions (i.e. fear, hostility, sadness, shame, and joy); (2) examine the reciprocal relationship between intrapersonal ER and interpersonal ER using a longitudinal design; (3) assess whether any gender differences will exist in the relationships in (1) and (2).

Hypotheses

- (i) Does greater PF contribute to more positive emotional experiences?
 - Will PF predict specific positive and negative emotions or will specific positive and negative emotions predict PF? Or will there be reciprocal relationships between PF and specific positive and negative emotions.
- (ii) Does PF influence the amount of and satisfaction with perceived social support?
 - Will PF predict PSS or will quantity of PSS predict PF?
 - Will PF predict the quality of PSS or will quality of PSS predict PF?
- (iii) Do boys and girls differ in the relationship between PF and specific emotions?
 - Does gender moderate the relationship between PF and each specific emotion?
- (iv) Do boys and girls differ in the relationship between PF and the amount of and satisfaction with PSS?
 - Does gender moderate the relationship between PF and quantity of PSS?
 - Does gender moderate the relationship between PF and quality of PSS?

Chapter 5: Methodology

The research presented in this thesis is part of a larger research project called the Wollongong Youth Study. Research approval was obtained from the Human Research Ethics Office (Ethics Number: HE10/158) at the University of Wollongong, New South Wales, Australia.

5.1 Participants and Procedure

Participants were recruited from an on-going longitudinal study investigating social and emotional well-being in early to late adolescents from five high schools in a Catholic Diocese of New South Wales, Australia. The questionnaires used in this study were measures that were included in the broader survey. For this study, questionnaires of students from Year 9 (Total students = 786; mean age = 14.68 years, SD = 1.47; 50.89% males) and Year 10 (Total students = 778; mean age = 15.41, SD = 0.53; 50.13% males) were used. The total number of students who completed questionnaires in both years was 883. Students were from lower to upper middle class socioeconomic standing and from diverse cultural backgrounds. The professions for parents, in the order of father then mother, included professionals & associate professionals, 28.3% and 28.8%, managers & administrators, 3.5% and 0.3%, , tradespersons, 24.7% and 2.1%, intermediate transport/production/sales & service, 11.9% and 16.4%, elementary sales/clerical/labourers, 6.7% and 13.5% respectively with the rest retired/unemployed/homemaker or not codable. Furthermore, reported parental status consisted of 85.2% married or cohabiting, 11.4% divorced or separated, and 3.4% were unknown. Ninety-five percent of students indicated they were born in Australia, however, only 28% indicated that both parents were born in another country.

Each year at the start of the second term of school (middle of the year), consent from schools, parents, and students was obtained and students were then invited to participate in the “Youth Issues” study. Each school informed all parents in this cohort of students prior to the testing day and parents provided consent accordingly. Students were surveyed in the second

term of their third and fourth years (Year 9 and Year 10) in high school through a standardized data collection method. Questionnaires were completed anonymously during regular class times under the supervision of the research team and teachers. At the end of the survey session, students were debriefed and thanked for their participation. Students who participated in both years were paired by their enrolment number provided by the school along with initials of their school name in order to obtain a unique ID. The remaining students who participated in either Year 9 or Year 10 consisted of students who were absent on the day of data collection or students who had changed schools. Differences between those who completed the questionnaires in both years and those who completed questionnaires at only one time point were 111 in Year 9 and 103 in Year 10 respectively.

The Catholic Diocese is based in the city of Wollongong, but also services the south-western metropolitan Sydney area. Students from schools in the south-western Sydney area were also surveyed, thereby contributing to the diversity and heterogeneity of the population sampled. The particular age range was chosen because mid-adolescents (14-16 years of age) have low emotional stability due to biological and social changes (as elaborated in chapter 4).

5.2 Attrition Analysis

In order to gauge if there was any difference between the students who could be paired (in Years 9 & 10) and students who completed the questionnaire at only one time point (in Year 9), mean levels of PF, the main variable of interest, were compared and found to be quite similar (paired $M_{AFQ-Y} = 1.11$ and non-paired $M_{AFQ-Y} = 1.04$). The similar PF mean levels indicate that there were no significant differences between students who participated and who were paired in Year 9 versus those who had changed schools or were absent. Moreover, no students who completed the survey had complained of any difficulties.

5.3 Measures

Psychological Flexibility (PF) was measured by the Avoidance and Fusion Questionnaire for Youth (AFQ-Y; Greco, Lambert, & Baer, 2008). Low scores on the AFQ-Y

indicate more psychological flexibility whereas high scores indicate that EA and cognitive fusion are more prevalent. Because the AFQ-Y was specifically developed for children and adolescents, it was used in this study. Additionally, the AFQ-Y has been shown to be psychometrically sound and is comparable to the adult version of the PF scale (i.e. the AAQ). Furthermore, various studies using the AFQ-Y in adolescents have not only been shown to be conceptually similar to other ER measures such as the DERS (Gratz & Roemer, 2004) but also contributed significantly and independently to emotionally-related problems in adolescents.

The AFQ-Y questionnaire consists of 17 items with respondents indicating how true each statement is for them (0 = Not at All True; 4 = Very True). Two sample questions are: “I push away thoughts and feelings I don’t like”, “I can’t be a good friend when I feel upset”. The AFQ-Y captures a single construct that measures two overlapping processes of psychological flexibility: (a) cognitive and emotional fusion, which refers to the entanglement and attachment with cognitive processes taking place privately and responding to them in a literal manner (Luoma & Hayes, 2009); and (b) experiential avoidance/control, which is the unwillingness to experience negatively evaluated private events. The total score was used for all statistical analyses.

Psychometric properties of the AFQ-Y were assessed over five studies using high-school samples. The reliability of AFQ-Y with 17 items was cross-validated between three measurement modelling methods, namely CFA, classical test theory, and Rasch modelling and was deemed to have adequate psychometric properties (Greco et al., 2008). Moreover, the AFQ-Y items were able to detect youth with elevated levels of psychological *inflexibility* (emphasis added) in a school sample which indicates its reliability in assessing individual patients. The AFQ-Y also showed adequate concurrent validity as scores on the AFQ-Y and child-reported anxiety, somatic complaints, and problem behaviour correlated significantly in the expected direction with medium to large effect sizes. The construct validity of the AFQ-Y was also supported by significant correlations between the AFQ-Y and similarly related measures such as the Child Acceptance and Mindfulness Measure (CAMM; Greco & Baer,

2006) and the White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994). Further regression analyses were conducted to determine these relationships. The results suggested that while the AFQ-Y overlapped with the CAMM and WBSI, it also contributed uniquely to the child-reported measures after controlling for the effects of the CAMM and WBSI. This indicates that while the AFQ-Y is comparable to similar constructs, it has also been shown to be different from them.

Greco et al. (2008) obtained Cronbach alphas of .90 for the AFQ-Y and similar alphas of .87 (Year 9) and .89 (Year 10) were obtained in the present study. Item-total correlations (Table 5.1) ranged from .34 to .58 in year 9 and .30 to .61 in year 10. The scale demonstrated adequate homogeneity in both years.

Table 5.1 Item-total correlation for the AFQ-Y, Year 9 and Year 10

<u>Items</u>	<u>AFQ-Y</u>	
	<u>Year 9</u>	<u>Year 10</u>
Item 1	.454	.463
Item 2	.592	.624
Item 3	.550	.557
Item 4	.560	.615
Item 5	.524	.538
Item 6	.397	.463
Item 7	.454	.507
Item 8	.449	.522
Item 9	.574	.591
Item 10	.450	.574

Item 11	.501	.592
Item 12	.534	.598
Item 13	.516	.596
Item 14	.536	.570
Item 15	.410	.467
Item 16	.584	.583
Item 17	.318	.298

Affective States (discrete emotions): The Positive and Negative Affect Schedule –

Expanded Form (PANAS-X; Watson & Clark, 1994) assesses a broad range of affective states that include negative affect and positive affect. Affect represents the valence and arousal aspects of discrete emotions and is generally considered as the organizing feature of emotions. The PANAS-X is a standard self-report measure of affect at the higher order level and discrete emotions at the lower order base level (Tellegen et al., 1999). Research shows that self-report measures have supported the affect level, i.e., positive and negative affect, categorization of emotions, but not enough research has examined a broad range of discrete emotions in one single measure. In this respect, the demonstrated hierarchical structure of the PANAS-X is a reliable measure of the different levels consisting of affect and emotions (Tellegen et al., 1999). For example, mean score patterns of the discrete emotions have been shown to be similar to the higher order scales as rated time frame (e.g. today, past few days, past week, and past month) lengthens for a range of clinical and non-clinical populations (Watson & Clark, 1994). Independent multifactorial analysis of the discrete emotions have also yielded clean and distinct one factor solutions for the various discrete emotions and appear to be broadly consistent with existing discrete emotion models proposed by Ekman (1993) and Izard (1993). Items

representing each discrete emotion appeared to be reasonably homogenous with little variability in reliability of the scales between rated time frames.

The norms and psychometric properties of the PANAS-X have also been assessed across clinical and non-clinical populations and different age groups ranging from early adults (undergraduate students) to a mixed pool of adults (Watson & Clark, 1994). Watson and Clark (1994) noted that the PANAS-X differentiated clinical patients from non-clinical samples as clinical patients reported significantly higher negative affect. The PANAS-X has been shown to have adequate internal consistency and construct validity. Cronbach's alpha for the discrete emotions ranged from the high .80's to the mid .90's across 11 samples and different rated time frames (Watson & Clark, 1994). In order to demonstrate convergent and discriminant validity, PANAS-X was compared to the Profile of Mood States questionnaire (POMS; McNair, Lorr, & Droppleman, 1971). The PANAS-X and the POMS was administered to an undergraduate sample (N = 563) with time frame instructions of "Past Few Weeks." The PANAS-X demonstrated convergent validity through its correspondence with the basic emotions scales of the POMS with high coefficients ranging from .85 to .91. The PANAS-X has also been shown to have strong self-peer convergence. Discriminant validity was demonstrated by comparing the mean correlations between discrete emotions in the PANAS-X and the POMS. The mean correlations in the PANAS-X between fear, hostility, sadness, and fatigue were significantly lower than the POMS. Additionally, modest gender differences were observed in some of the expected discrete emotions (e.g. men reported significantly higher in hostility while women reported significantly higher in fear), indicating a certain level of distinction among discrete emotions.

Apart from the more than acceptable hierarchical structure and psychometric properties of the PANAS-X, it has also been shown to be suitable for studies with a survey design. The relatively quick but comprehensive assessment of discrete emotions makes the PANAS-X easy to administer in surveys. Additionally, discrete emotion items are made-up of relatively simple single words which considerably reduce confounding with other psychological variables in

comparison to other single emotion measures such as the STAXI or the guilt measures that uses short sentences to assess emotions. Furthermore, the PANAS-X can also be used as state or trait measures. The PANAS-X has been shown to correlate strongly with other state measures that assess state affect and psychiatric symptoms, indicating its short-term applicability (Watson & Clark, 1994). Similarly, the trait-like applicability of the PANAS-X was demonstrated through its temporal stability in a longer-term analysis of responses from undergraduates approximately six months apart for almost four years. The retest stability correlation over the extended period of time was significant and was .43 for negative affect and .39 for positive affect (Watson & Clark, 1994).

The structural model of the PANAS-X has also been investigated in children and adolescents. Investigations of the structure of the PANAS and the PANAS-C in children and adolescents have mainly yielded a two-factor solution, i.e. negative affect and positive affect. More recent investigations have shown that the underlying common variance yielded a three-factor model consisting of positive affect, fear and distress in children, adolescents, and young adults (Allen, Lonigan, & Phillips, 2015). Fear and distress emerged as separate negative affect factors, demonstrating a more granularized aspect of negative affect. These results indicate that the PANAS-X represents an integrative measure where lower order levels are subsumed in the preceding levels but each particular level have their own characteristics (Lerner & Kauffman, 1985). Based on these recent findings of the granularity of negative affect in the PANAS-X, it can be assumed that the measurement of discrete emotions using the PANAS-X is appropriate and that the integrity of the results can be maintained.

The PANAS-X consists of 60 items that assesses 11 specific affects; fear, sadness, guilt, hostility, shyness, fatigue, surprise, joviality, self-assurance, attentiveness, and serenity. In order to reduce testing demands (completion time), only fear (e.g., “afraid,” “scared”; six items in total), hostility (e.g., “scornful,” “disgusted”; seven items in total) sadness (e.g., “sad,” “blue”; five items in total) and shame (e.g., “disgusted with self,” “ashamed”; six items in total) were administered to represent negative affect (NA). For positive affect (PA), only joviality

was used since it reflects a wide range of PA with items such as “happy,” “joyful,” “delighted,” “cheerful,” “excited,” “enthusiastic,” “lively,” and “energetic” (8 items in total). Students were asked to describe their feelings and emotions during the past month on a 5 point rating scale (1 = Very slightly or not at all; 5 = Extremely).

In this study, internal reliabilities (Table 5.2) for the five affective states in year 9 and year 10 ranged from .84 to .96, which is similar to Cronbach alphas obtained across several samples in the PANAS-X manual (Watson & Clark, 1994). Moreover, mean averages of the discrete emotions examined in year 9 and year 10 in this study were similar to mean averages of undergraduate students in the PANAS-X manual.

Table 5.2 Cronbach Alphas for Fear, Hostility, Sadness, Shame, and Joy in Year 9 and Year 10

Affective States	Cronbach Alphas	
	Year 9	Year 10
Fear	.89	.89
Hostility	.85	.84
Sadness	.92	.93
Shame	.94	.96
Joy	.92	.91

Social Support: The Social Support Questionnaire (SSQ; I. Sarason, Sarason, & Shearin, 1986) is a subjective measure of the quantity (SSQ number or SSQ-N) and quality (SSQ satisfaction or SSQ-S) of relationships in the life of an individual. What this questionnaire attempts to measure is the respondent’s perception of whether they feel loved or valued. These feelings are based on the number of people in their social support network and the satisfaction with the people they have indicated. The number of people indicates the people they can rely on and from whom they can expect support from in certain circumstances and the second part indicates satisfaction with these social supports. The SSQ-N and SSQ-S have been

found to have a modest correlation which indicates that the two subscales are not measuring the same concept (I. Sarason, Levine, Basham, & Sarason, 1983). The SSQ was developed based on the assumption that an individual develops a general sense of support through an aggregate of perceived supportive interactions which culminate into expectations of how a social environment is likely to be (Pierce, Sarason & Sarason, 1996). Social support as perceived has appeared to be stable for approximately 3 years (Sarason, Sarason, & Shearin, 1986).

The SSQ has evolved out of a number of pilot studies (I. Sarason et al., 1983). The SSQ has been assessed with measures of personality, social desirability, positive-negative life experiences, self-esteem, and internal-external locus of control. It was found that the SSQ was negatively related to psychological discomfort, neuroticism, and pessimism, particularly in females. In contrast, the SSQ-N was positively correlated with extraversion but not SSQ-S. A positive correlation was also found between SSQ and self-esteem. People who reported more positive than negative life events were also found to report a higher number of social supports and were more likely to experience positive events as they had expected. The researchers suggested that those who were high on social support were better able to manage their own psychological needs and were therefore better at managing social support relationships as they experienced more rewarding interpersonal relationships (I. Sarason et al., 1983).

The SSQ has also been used extensively with adolescents and young adults in order to assess the protective effects of social support (e.g. Compas, Slavin, Wagner, & Vannatta, 1986; Dumont & Provost, 1998; Holden, Brown, & Mott, 1988). The full SSQ (27 items) was administered to 20 participants in a pilot study consisting of alcohol abusing and nonabusing adolescents in the age bracket of 12-17 years (Holden, Brown, & Mott, 1988). Some of the questions appeared to be confusing for these adolescents, especially items pertaining to marital social support. However, some relevant items were also found and these have been used to guide the choice of questions in the Wollongong Youth Study.

In the current study, the brief version of the SSQ was used which contained four items for four sets of circumstances. The original version of the SSQ contains 27 questions but only

four items were selected due to two reasons. First, only those items were selected that have been found relevant for adolescents and second, the questionnaire had to be abbreviated due to the length of the battery of questionnaires in the survey. The students first listed the number of people that they perceived were available for support. Then they were asked to rate how satisfied they were with the people they listed on a 6-point scale ranging from very dissatisfied (1) to very satisfied (6). The four-items included the following questions: (1) “Who do you feel really appreciates you as a person?” (2) “Who can you count on to help you out in a crisis situation, even though they would have to go out of their way to do so?” , (3) “Whose lives do you feel you are an important part of?” , and (4) “Who can you really count on when you need help?”,

Responses to the SSQ were then coded according to categories for type of support which included parent, nonparent family member, friend, others, and no-one. The number of social supports were counted and used as the total number for each question and then the mean number of social supports was extracted based on the four questions for each individual. The total number of social support ranged from zero to ten. Similarly, mean scores of the dimension measuring satisfaction was averaged across the four questions for each individual to obtain the perceived satisfaction with social support score.

The SSQ, both quantity and quality, have been shown to have good internal consistency with alphas greater than .80 (Ciarrochi, Heaven, Supavadeeprasit, 2008; Dumont & Provost, 1999; Compas et al., 1986) and likewise in the present sample, alphas were all greater than .80 for both years. The SSQ also has good criterion-related validity (see Friedman et al., 2006). It seems that the abbreviated version had homogeneity for both constructs. Additionally, significant correlations were obtained between the SSQ-N and SSQ-S (Year 9, $r = .36$; Year 10, $r = .44$). This is in line with other studies in adolescents (Compas et al., 1986; Dumont and Provost, 1999; Rao, Hammen, & Poland, 2010). The reported amount of PSS may not necessarily match with that of satisfaction with PSS as satisfaction is a reflection of the perceived support received in the past and this may not be the same as current reports of PSS

networks. Furthermore, similar item-total correlations for the SSQ-S were obtained in Year 9 and Year 10, suggesting that the same underlying construct was being measured in both years (see Table 5.3. for item-total correlations)

Table 5.3 Item-total correlations for perceived satisfaction with social support in Year 9 and Year 10

<u>Items</u>	<u>Year 9</u>	<u>Year 10</u>
<i>Item 1.</i> Who do you feel really appreciates you as a person? How satisfied are you with this support?	.609	.645
<i>Item 2.</i> Who can you count on to help you out in a crisis situation, even though they would have to go out of their way to do so? How satisfied are you with this support?	.609	.660
<i>Item 3.</i> Whose lives do you feel you are an important part of? How satisfied are you with this support?	.657	.707
<i>Item 4.</i> Who can you really count on when you need help? How satisfied are you with this support?	.633	.696

Chapter 6: Results

6.1 Preliminary analyses

Preliminary descriptive analyses and correlations were conducted with the overall dataset consisting of 883 participants. Means and standard deviations are presented in Table 6.1. In the initial analysis, mean differences were explored for PF and each emotion between Year 9 and Year 10 participants. No significant mean differences were observed for PF and any of the negative emotions, however, positive affect and amount of social support decreased significantly from Year 9 to Year 10.

Table 6.1 Means and Standard Deviations for PF and Specific Emotions and Amount of and Satisfaction with Social Support for Years 9 and 10

Variables	Year 9		Year 10		t-value
	Means	SD	Means	SD	
Psychological Flexibility	1.10	.69	1.13	.72	.78
Fear	1.85	.83	1.84	.80	.26
Hostility	1.94	.81	1.97	.79	-.69
Sadness	2.00	1.07	2.01	1.06	.04
Shame	1.76	.95	1.76	.90	.58
Joy	4.00	.88	3.94	.90	2.40*
Social Support Amount	5.91	2.31	6.29	2.25	-4.51*
Social Support Satisfaction	5.33	.68	5.36	.72	-1.22

* $p < .05$

Additionally, the effect of gender (between subjects variable) between year 9 and year 10 was also evaluated using a 2 (gender) by 2 (year) repeated measure ANOVAs for the PF measure, each emotion, and number of and satisfaction with social support. No significant interactions were observed between time (from Year 9 to Year 10) and gender. No significant gender effects were found in PF, hostility, and social support satisfaction. However, significant gender effects were found for fear ($M_{boys} = 1.66$, $M_{girls} = 2.06$, $F = 55.36$, $p < .01$), sadness ($M_{boys} = 1.73$, $M_{girls} = 2.27$, $F = 58.56$, $p < .01$), joy ($M_{boys} = 3.92$, $M_{girls} = 4.07$, $F = 5.81$, $p < .05$), shame ($M_{boys} = 1.68$, $M_{girls} = 1.83$, $F = 5.76$, $p < .05$), and social support quantity ($M_{boys} = 5.58$,

$M_{girls} = 6.63, F = 49.78, p < .01$). In general, girls reported higher levels of negative affect and lower levels of positive affect than boys. Similarly, girls reported higher amounts of social support than boys.

Pearson's correlations between Years 9 and 10 PF with each discrete emotion are presented in Table 6.2. These findings indicate significant negative associations between PF and negative affect and significant positive associations between PF and positive affect and social support variables. Larger correlations were observed between PF and negative emotions in comparison with PF and Joy and PF and the social support variables.

Table 6.2 Correlations between PF and Specific Emotions and Amount of and Satisfaction with Perceived Social Support for Years 9 and 10

Psychological Flexibility		
Emotions & Social Support	Year 9	Year 10
Year 9	N = 737-761	N = 654-674
Year 9		
Fear	-.43**	-.31**
Hostility	-.37**	-.30**
Sadness	-.48**	-.44**
Shame	-.54**	-.41**
Joy	.28**	.22**
Social Support Amount	.22**	.09*
Social Support Satisfaction	.22**	.17**

Psychological Flexibility		
Emotions and Social Support	Year 9	Year 10
Year 10	N = 649-664	N = 756-774
Fear	-.32**	-.41**
Hostility	-.30**	-.38**
Sadness	-.34**	-.45**
Shame	-.29**	-.47**
Joy	.24**	.31**
Social Support Amount	.22**	.16**
Social Support Satisfaction	.24**	.19**

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

6.2 Data Analyses

Structural Equation Modeling (SEM) was used to determine the most appropriate factorial invariant model based on the maximum likelihood technique in Mplus 6.1 (Muthen & Muthen, Los Angeles, CA). To test the hypotheses of the reciprocal relationships between PF and discrete emotions across gender, a multi-group cross-lagged panel model between PF and each emotion and PF and the amount of and satisfaction with social support were analysed. Latent variables were used for all analyses as measurement error can be estimated (Little, 2013). To represent a latent variable, three item parcels were used to limit the number of indicators. Items were assigned to three parcels so that parameters estimated were kept to the minimum possible in order to allow for sufficient power in modelling especially while estimating correlated errors (Hau & Marsh, 2004). Each parcel was assigned an equal number of items as far as possible; however, given the odd number of items for certain variables, some items were unevenly distributed. For example, for PF with 17 items, two parcels contained 6 items and 1 parcel had 5 items. Only items for the social support quality and quantity variables were not parcelled as these variables contained only 4 items each. The analytical procedure was conducted in three steps.

In step 1, multi-group SEM were specified and tested for invariance in males and females. The analyses commenced with separate confirmatory factor analyses (CFA) models for all variables (PF, 5 emotions, and 2 social support variables) across gender. Measurement invariance across gender was conducted by starting from the least restrictive model, i.e. configural invariance (baseline model with no constraints) to weak (equality constraints for factor loadings) and finally to strong (equality constraints for intercept) invariance. If the test for strong measurement invariance passes, it can be concluded that the same underlying construct is being measured in both groups and therefore strong measurement invariance is achieved. In step 2, longitudinal measurement invariance was added to the CFA model in order to test whether the constructs remained unchanged over the passage of time, which in this case is over a one year time period. Factor loadings were constrained across time in addition to

measurement invariance across gender. In step 3, the structural part of the model was fitted and tested to determine the predictive relationships between PF and each emotion and to determine whether there were any differences between males and females. These were tested by placing equality constraints on the cross-lagged paths in males and females. If gender was not a moderating factor, then the combined dataset (both boys and girls included) was used to test the temporal status of PF. Only longitudinal measurement constraints were placed starting from configural invariance to strong invariance. If strong invariance held, then the structural model was fitted and tested.

Both gender and longitudinal measurement invariance is demonstrated when a set of goodness of fit statistics does not deteriorate significantly while comparing increasingly restricted models. The criteria for goodness of fit statistics between PF and each emotion model and between PF and the amount of and satisfaction with social support models were all considered separately. The goodness of fit statistics used for accepting each model were as follows: (a) the root mean square error of approximation (RMSEA) value of 0.05 or less, (b) the comparative fit index (CFI) values greater than 0.95, and (c) the Tucker-Lewis index (TLI) or the non-normed fit index (NNFI) values greater than 0.95. The evidence for measurement invariance is confirmed when the goodness of fit statistics is compared from the least restricted baseline model to the more restricted nested models (Cheung & Rensvold, 2002; Chen, 2007). Change in RMSEA values of less than or equal to .015 and the changes in values of the CFI and TLI/NNFI of .01 or less were used as criteria for accepting more restricted nested models. Chi square tests were not used in determining tests of weak to strong factorial invariance of the measurement models as they are often sensitive to large sample sizes. The RMSEA, the CFI, and the TLI/NNFI are more widely used with larger sample sizes for comparing nested models (Cheung & Rensvold, 2002; Meade, Johnson, & Braddy, 2008).

6.2.1 Treatment of Missing Data and Non-Normal Data

Of concern were two kinds of missingness observed in the dataset. First, missingness due to attrition consisted of students who completed the questionnaires at only one time point

whereas missingness due to nonresponse consisted of attempted questionnaires with incomplete answers. Missingness due to attrition is not really considered as missing completely at random and therefore traditional methods such as listwise deletion can bias the parameter estimates. Furthermore, the dataset was analysed for multivariate normality but was found to have a non-normal distribution. A non-normal data distribution violates the SEM assumption of normality which can again lead to biased parameter estimates. To address both kinds of missingness and non-normal distribution of data, the MLR estimator in Mplus 6.1 was used. The MLR estimator is considered to be robust and is comparable to other estimators.

6.2.2 Measurement Invariance across Gender and Time

The preliminary statistics results were used to guide the SEM analyses. In the pairwise repeated measures test for gender above, most emotions indicated significant differences between boys and girls and therefore, a multi-group model was used to test for measurement invariance that first commenced with establishing invariance across gender. While proceeding from the configural model to strong invariance model for gender, the model maintained a good fit to the data for all emotions and PF with a minimal deterioration in the goodness of fit statistics and with cut-offs of RMSEA, CFI, and TLI/NNFI below the threshold for acceptable model fit as recommended by Chen (2007). Strong measurement invariance held across gender between PF and all emotions and between PF and amount of social support and satisfaction with social support. This implies that the measurement characteristics of the indicators were the same for both boys and girls. After verifying measurement invariance across gender, constraints to factor loadings across time were added to the model to test for the interaction between measurement invariance across gender and weak invariance across time. The goodness of fit statistics remained within a good range with minimum deterioration in the threshold of acceptable model fit. A further measure of strong invariance across time was not attempted as it was deemed unnecessary given that no mean differences were found for most variables (except for joy and amount of social support).

6.2.3 Evaluation of the Structural Models for the Moderating effects of Gender

The core estimated model included autoregressive paths for PF and each emotion, within-time correlations (i.e. correlations between Time 1 PF and Time 1 emotion), and bidirectional cross-lagged paths (i.e. PF to emotion and emotion to PF). This was deemed the most parsimonious model given data for only two time points. The autoregressive paths are a priori directional paths that provide information on the stability of each latent construct from Time 1 to Time 2. Higher values indicate that the construct is considered more stable. The bidirectional cross-lagged paths represent possible associations between PF and each emotion with information on the effect of change from one variable on another over time.

The aim of the current study was to test the hypothesis of the temporal status of PF and each emotion and PF and the amount of and satisfaction with social support and whether the moderating effects of gender play a role in each relationship. A fully forward model was tested. With data spanning only two time points, a series of full cross-lagged panel models were tested and specified cutoff values in the fit indices were used to determine any deterioration in the model. Model 1 is the baseline model and is equivalent to the CFA model in terms of degrees of freedom. In the baseline model, factor loadings and intercepts are constrained for gender invariance but the autoregression paths and cross-lagged paths are freely estimated. Model 2 is similar to the baseline model with autoregression and cross-lagged paths freely estimated but further constraints placed on factor loadings across time. Model 3 maintains the constraints, however, cross-lagged paths are constrained to be equal between boys and girls to test for moderation effects.

Table 3 provides model fit indices between PF and each emotion and PF and amount of and satisfaction with social support when proceeding from Model 1 to Model 3. Upon observation of the fit indices, Model 1 is the best fitting model as a larger number of parameters are unconstrained and allowed to be freely estimated. While proceeding from Model 1 to Model 3 with increasingly constrained parameters, a decrease in model fit can be seen with increases in chi square values. Although a worsening of model fit indices was obtained, changes in CFI,

TLI and RMSEA (using indices criteria as specified by Cheung and Rensvold (2002) and Chen (2007), did not indicate meaningful changes in the indices. This suggests that invariance is present from Model 1 to Model 3 (see Table 6.3 for goodness of fit indices for all 3 models for PF and each emotion and PF and PSS).

In total, seven SEM analyses were conducted and these included PF and fear, PF and hostility, PF and sadness, PF and shame, and PF and joy, PF and amount of social support, and PF and satisfaction with social support. Gender did not have any moderating influence in the relationship between PF and each emotion and between PF and amount of and satisfaction with social support. The results obtained were concluded to be generalizable across gender.

Table 6.3 Goodness of Fit Indices for PF, Specific Emotions and Amount of and Satisfaction with Perceived Social Support – Structural Models

Model	χ^2	Df	RMSEA	CFI	TLI
Fear N = 883					
Model 1	153.257	100	.035	.986	.982
Model 2	163.351	104	.036	.985	.980
Model 3	171.790	108	.037	.983	.980
Hostility N = 882					
Model 1	115.292	100	.019	.996	.994
Model 2	123.960	104	.021	.994	.993
Model 3	125.550	108	.019	.995	.994
Shame N = 882					
Model 1	120.318	100	.021	.996	.995
Model 2	125.494	104	.022	.996	.995
Model 3	145.111	108	.028	.993	.991
Joy N = 882					
Model 1	109.577	100	.015	.998	.997
Model 2	119.296	104	.018	.997	.996
Model 3	125.835	108	.019	.996	.995
Social Support Amount					
N = 883					
Model 1	222.880	148	.034	.981	.977
Model 2	230.826	153	.034	.981	.977
Model 3	231.428	157	.033	.981	.978
Social Support Satisfaction					
N = 883					
Model 1	194.517	148	.027	.984	.981
Model 2	201.144	153	.027	.984	.981
Model 3	203.161	157	.028	.984	.982

Note: χ^2 = Chi Square, RMSEA = Root Mean Square of Approximation, CFI = Comparative Fit Index, TLI = Tucker Lewis Index

6.2.4 Analyses of the temporal status of PF

Given that gender was not a moderating factor, the combined dataset (both boys and girls together) was used instead and only longitudinal measurement invariance was imposed to test for the antecedent, consequence, and reciprocal status of PF. Table 6.4 contains goodness of fit indices for the configural, weak, and strong invariance models. Strong invariance held for most relationship combinations except for PF and shame. This is an indication that there is more variability in the mean levels of the shame emotion. For further analysis of the structural

Table 6.4 Goodness of Fit Indices for PF and Specific Emotions and Amount of and Satisfaction with Perceived Social Support - Longitudinal Invariance

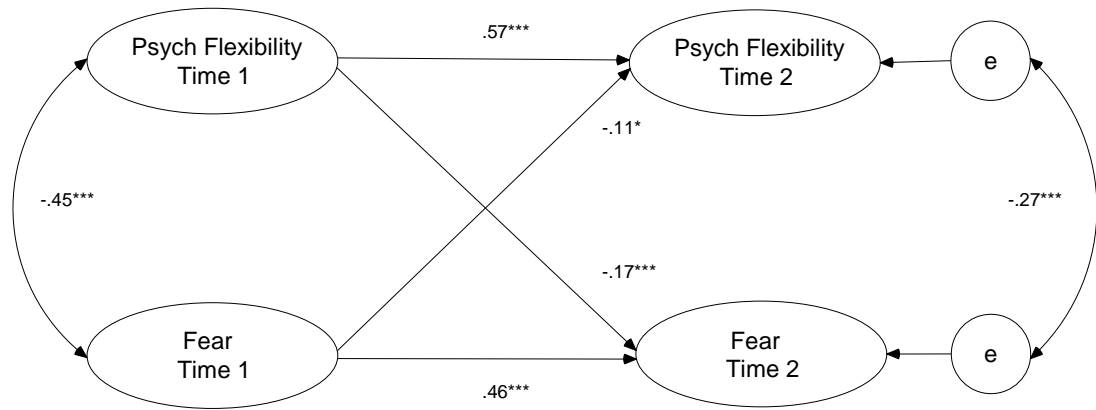
Model	χ^2	Df	RMSEA	CFI	TLI
Fear N = 883					
Configural Invariance	84.059	42	.034	.989	.983
Weak Invariance	93.048	46	.034	.988	.982
Strong Invariance	109.111	52	.035	.985	.981
Hostility N = 882					
Configural Invariance	40.682	42	.000	1.000	1.001
Weak Invariance	49.149	46	.009	.999	.999
Strong Invariance	69.807	52	.020	.995	.993
Sadness N = 882					
Configural Invariance	53.430	42	.018	.998	.996
Weak Invariance	60.535	46	.019	.997	.996
Strong Invariance	71.532	52	.021	.996	.995
Shame N = 882					
Configural Invariance	65.723	42	.025	.995	.993
Weak Invariance	70.744	46	.025	.995	.993
Strong Invariance	1034.053	52	.146	.805	.753
Joy N = 882					
Configural Invariance	49.898	42	.015	.998	.997
Weak Invariance	58.777	46	.018	.997	.996
Strong Invariance	74.855	52	.022	.995	.994
Social Support Amount N = 883					
Configural Invariance	104.572	64	.027	.987	.981
Weak Invariance	112.043	69	.027	.986	.981
Strong Invariance	142.689	76	.032	.978	.973
Social Support Satisfaction N = 883					
Configural Invariance	71.395	64	.011	.997	.996
Weak Invariance	76.967	69	.011	.997	.996
Strong Invariance	91.621	76	.015	.994	.993

Note: χ^2 = Chi Square, RMSEA = Root Mean Square of Approximation, CFI = Comparative Fit Index, TLI = Tucker Lewis Index

The structural part of the model was considered after examining measurement invariance. The cross-sectional associations between PF and each emotion and PF and PSS were first examined. Significant correlations were found for all seven cross-lagged models. Next, significant autoregressive estimates from Time 1 to Time 2 were also observed for all variables, i.e., PF, each emotion, and the amount of and satisfaction with social support. The autoregressive estimates across all seven models for each variable were high enough to suggest that the aggregate standing of the constructs being measured in Time 1 and Time 2 were relatively the same. Cross-lagged paths were used to determine antecedent, consequence, and reciprocal relationships between PF and each emotion and PF and amount of and satisfaction with social support. PF is considered an antecedent of an emotion or PSS when the cross-lagged estimate from PF in Time 1 to the emotion or PSS in Time 2 is significant while the cross-lagged estimate from an emotion or PSS in Time 1 to PF in Time 2 is not significant. PF is considered a consequence when the cross-lagged estimate from an emotion or PSS in Time 1 to PF in Time 2 is significant but the cross-lagged estimate from PF in Time 1 to an emotion or PSS is not significant. A reciprocal relationship between PF and an emotion or PSS is obtained when cross-lagged estimates for both PF and an emotion or PSS from Time 1 to Time 2 are significant. The relationship between PF and each emotion and were not all the same whereas the relationship between PF and the amount of and satisfaction with social support were the same. Figures 6.1 to 6.7 contain the estimates of the structural paths for PF and each emotion and PF and amount of and satisfaction with social support.

In the category of negative emotions, fear was found to have a reciprocal relationship with PF (Figure 6.1). In the reciprocal relation between fear and PF, the effects of change from PF to fear were notably larger than the effects of change from fear to PF. The magnitude of the cross-lag paths with PF as an antecedent and as a consequence were tested for significance by comparing a model with cross-lag paths constrained to be equal against a model with unconstrained paths. A significant difference in the chi-square was found and therefore it was concluded that PF was a stronger predictor of fear.

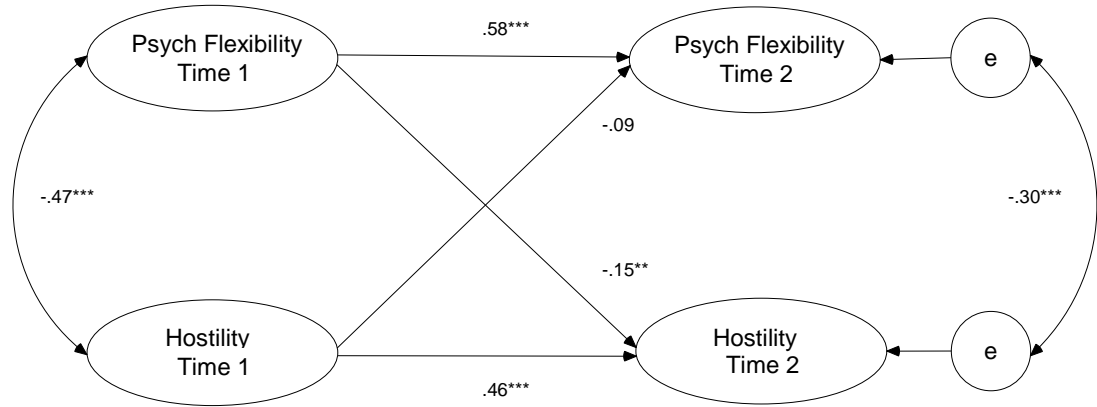
Figure 6.1 SEM of Year 9 PF and Fear predicting Year 10 PF and Fear



*** $p < .001$, ** $p < .01$, * $p < .05$

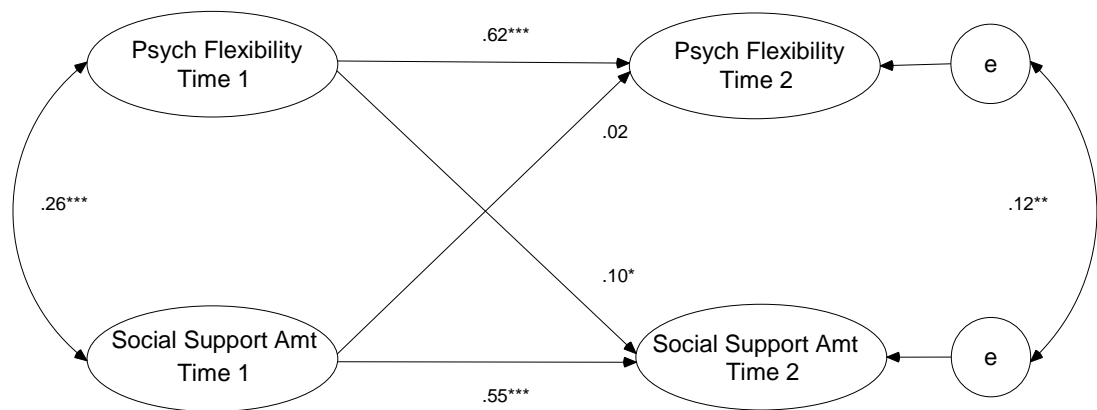
Psychological flexibility was found to be an antecedent of hostility (Figure 6.2), the amount of social support (Figure 6.3), and satisfaction with social support (Figure 6.4). The cross-sectional correlation between PF and hostility were in the high range while the cross-sectional correlation between PF and the amount of and satisfaction with social support were in the small to moderate range. In all three models, the autoregressive estimates were high enough ($p < .001$) to suggest that the relative standing of each construct (i.e. PF, hostility, and PSS) measured in Time 1 and Time 2 were likely to have measured the same construct. The cross-lagged estimates indicate that in addition to the correlation at baseline between PF and hostility, a decrease in PF (from Time 1 to Time 2) is likely to have an effect on hostility. While an increase in PF is likely to positively influence the amount of social support and satisfaction with social support.

Figure 6.2 SEM of Year 9 PF and Hostility predicting Year 10 PF and Hostility



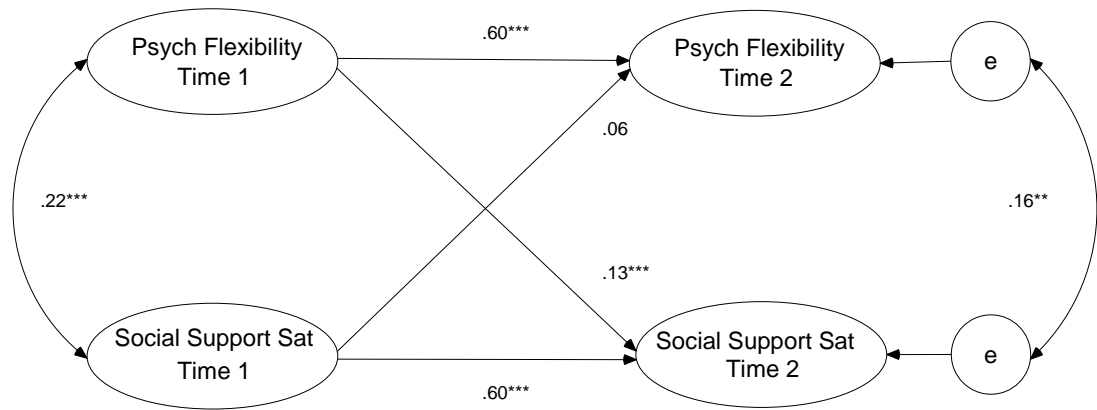
$^{***}p < .001$, $^{**}p < .01$, $^{*}p < .05$

Figure 6.3 SEM of Year 9 PF and Amount of Social Support predicting Year 10 PF and Amount of Social Support



$^{***}p < .001$, $^{**}p < .01$, $^{*}p < .05$

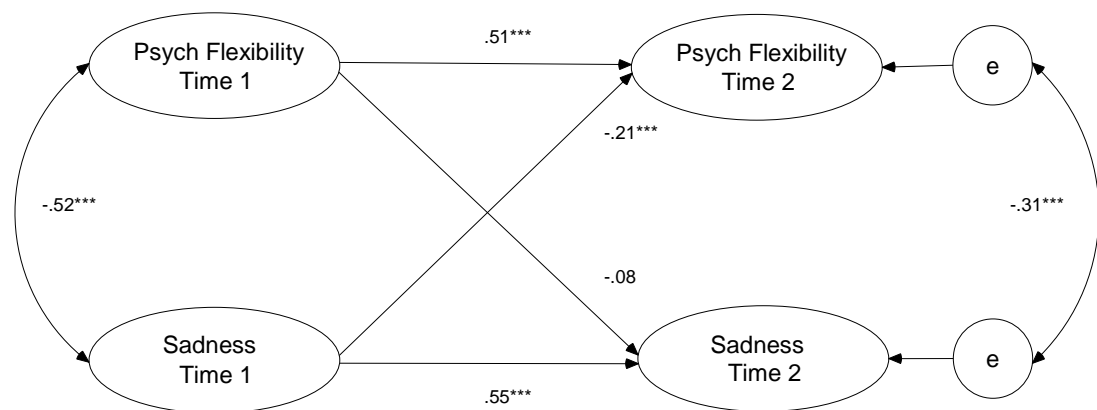
Figure 6.4 SEM of Year 9 PF and Social Support Satisfaction predicting Year 10 PF Social Support Satisfaction



*** $p < .001$, ** $p < .01$, * $p < .05$

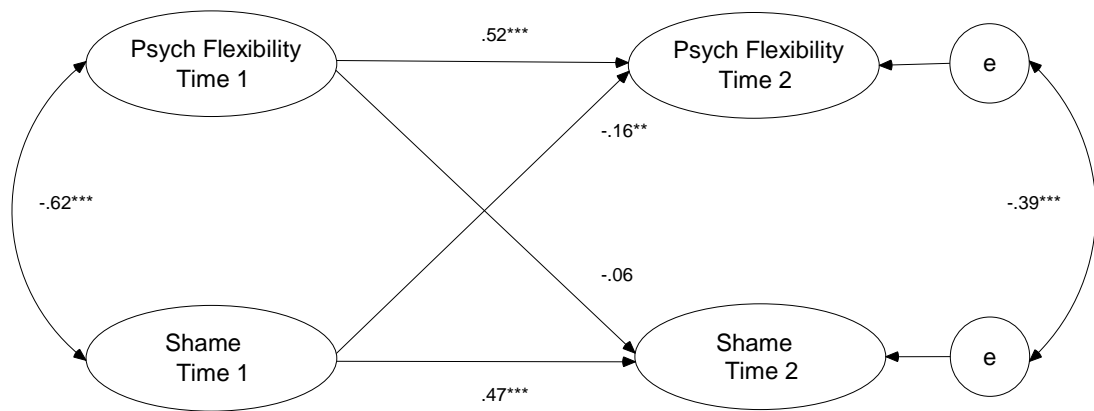
Psychological flexibility was found to be a consequence of sadness (Figure 6.5) and shame (Figure 6.6). The cross-sectional correlations at baseline and the autoregressive estimates were considered as being in the high range ($p < .001$) for both models. The high autoregressive estimates indicate that each construct (i.e. PF, sadness, and shame), measured in Time 1 and Time 2, were measuring the same construct. The cross-lagged estimates suggest that in addition to the high correlations at baseline, those that experienced increases in sadness or shame, were most likely to become less psychologically flexible.

Figure 6.5 SEM of Year 9 PF and Sadness predicting Year 10 PF and Sadness



*** $p < .001$, ** $p < .01$, * $p < .05$

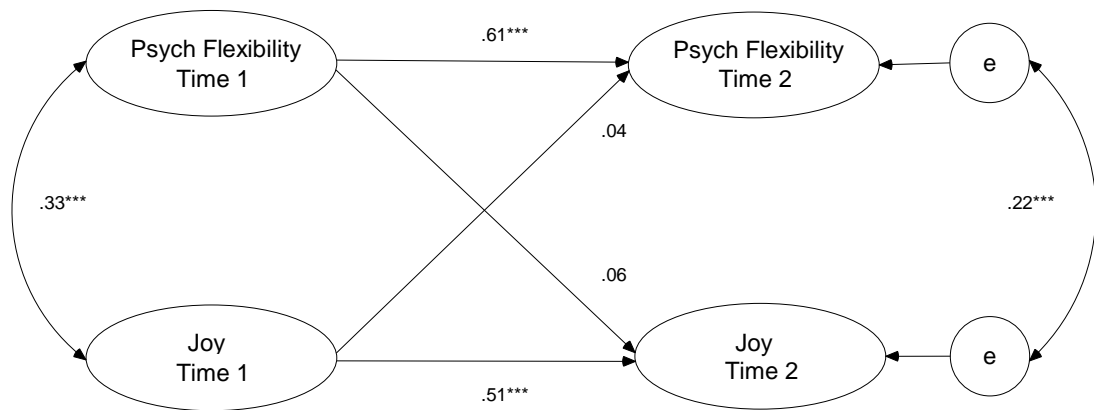
Figure 6.6 SEM of Year 9 PF and Shame predicting Year 10 PF and Shame



*** $p < .001$, ** $p < .01$, * $p < .05$

As for the relationship between PF and joy (Figure 6.7), cross-sectional correlations were in the moderate range but autoregressive estimates were in the high range ($p < .001$). The high autoregressive estimates suggest that the same constructs were being measured (i.e. PF and joy) in Time 1 and Time 2. Cross-lagged path estimates between PF and joy were not found to be significant in both directions indicating that although PF and joy were moderately correlated at baseline, changes in either PF or joy did not have an effect on the other variable.

Figure 6.7 SEM of Year 9 PF and Joy predicting Year 10 PF and Joy



*** $p < .001$, ** $p < .01$, * $p < .05$

Chapter 7: General Discussion

The objectives of this study were to explore the reciprocal relationship between PF, emotional well-being, and social well-being in adolescents using a longitudinal design. Additionally, this study also explored whether gender varied in the transactional relationships. Psychological flexibility, emotional experiences, and social support are all considered risk and protective factors in adolescents and the relationships between them is likely to enhance an understanding of the development of emotional and social well-being for adolescents identified with mental health problems. This discussion will focus on (1) the reciprocal influences between PF and each emotion and between PF and the amount of and satisfaction with social support, (2) the limitations of the study, and (3) theoretical implications and suggestions for future research. First, a summary of the main results are presented below.

Descriptive statistics showed that during the one year period, adolescents experienced a significant reduction in joy. The finding of a significant decrease in positive affect is similar to previous research findings suggesting that the experience of positive emotions decreases substantially during this age period (Larson & Lampman-Petratis, 1989; R. W. Larson et al., 2002). Additionally, a significant decrease in the perception of the amount of social supports was reported in the one year period. Mid-adolescents (14-16 years of age) are likely to report reduced numbers in perceived social support as they tend to become increasingly autonomous from their parents while learning to make decisions independently (Eccles et al., 1993). Consequently, adolescents are likely to perceive that they have less people to rely on for support due to a temporary increase in conflict with parents during mid-adolescence (De Goede, Branje, Delsing, et al., 2009). Additionally, although adolescents become increasingly closer to their peers, they are still settling into their peer groups and therefore they are likely to report fewer social supports (De Goede, Branje, Delsing, et al., 2009).

Gender differences were observed for several emotions and for the amount of social support. Girls experienced significantly higher levels of fear, sadness, shame, and joy than boys. Girls also reported greater amounts of social support than boys, which is consistent with

prior research. No significant gender differences were found for PF, hostility, and satisfaction with social support. Reliable gender differences in affect have not been found in adults (Watson & Clark, 1994) and nor in the studies that examined the structure of the tripartite model in adolescents (Chorpita, 2002; Lonigan, Phillips, & Hooe, 2003). However, these studies mainly examined emotions in the context of the higher dimensional approach (i.e. negative affect and positive affect). Similarly, gender differences have not been reported in studies that have examined specific emotions (e.g. De Rubeis & Hollenstein, 2009). In contrast, gender differences in specific emotions have been found in other studies (e.g. Eberhart et al., 2006; Hankin & Abramson, 2001; Hart, 1999; Muris et al., 2005). The issue of possible gender differences in specific emotions deserves additional investigation due to conflicting findings. In this study, girls also reported a significantly greater amount of social support than boys. Gender differences in the amount of social support are consistent with another longitudinal study that suggested that girls reported higher numbers of social supports while numbers of social support reported by boys usually stabilize during mid-adolescence (De Goede, Branje, & Meeus, 2009). Gender differences in each emotion will be discussed further in the implications of the longitudinal relationships sections for each emotion.

This thesis examined reciprocal relationships between PF and each emotion, PF and PSS by using a 1-year cross-lagged longitudinal panel design. It was found that PF was predictive of hostility, sadness and shame was predictive of PF, PF had a reciprocal relationship with fear, and PF was not significantly related to joy. PF was also found to be predictive of the perceived amount of and perceived satisfaction with social support. In the analysis of the moderating role of gender, boys and girls did not differ in the longitudinal relationship between PF and emotions and between PF and the amount of and satisfaction with perceived social support.

When low PF precedes an emotion or PSS, it could be viewed as a precursor or a vulnerability to that variable. The results in this study support the proposition that low levels of PF can act as a psychological vulnerability and as ER processes that can lead to potential emotional problems or perpetuate the dysregulation of emotions (Forsyth et al., 2003; Kashdan

et al., 2006a; Venta, Hart, & Sharp, 2013). The predictive status of PF is similar to the original vulnerability-stress model in which some cognitive styles can act as a psychological vulnerability and can influence the development of negative psychological outcomes (Abramson et al., 1989; Beck, 1983).

When emotion is predictive of PF, then PF can be viewed as a coping style that is similar to emotion-focused coping. Emotions are usually appraisals of the strain or stress experienced in a particular situation. Low levels of PF can serve to perpetuate the experience of emotions and contribute to the maintenance of those emotions (Hughes et al., 2011; Silk et al., 2003; Veilleux et al., 2014). The interaction between emotions and low levels of PF can eventually contribute to the development of psychopathology as has been found in other longitudinal studies in which avoidance mediated the association between the emotion and depression (e.g. De Rubeis & Hollenstein, 2009).

The reciprocal relationship between low levels of PF and an emotion indicates that PF and negative emotions mutually influence each other. In other words, when one variable decreases (e.g. PF), the other increases (e.g. negative affect) and when one increases, the other decreases. The reciprocal relationship is consistent with the transactional cognitive vulnerability to stress model in which cognitive style and emotions are likely to influence each other reciprocally over time (Calvete et al., 2013; Hankin & Abramson, 2001).

The insignificant gender differences in the longitudinal relationships between PF, specific emotions, and PSS suggests that even though gender differences exist at the single variable level, the longitudinal effects disappear when emotions and PSS are paired with an ER variable such as PF. These findings are both similar and contrary to some findings found in other studies. In several other multi-wave longitudinal studies that investigated transactional models or pathways, gender differences were not found (e.g. Barrocas & Hankin, 2011; Calvete et al., 2013, 2015). Contrary to the findings in the current study, gender differences were found in other longitudinal studies (e.g. Abela & Hankin, 2011; Abela et al., 2012; Calvete, 2011). It seems that the mixed findings of the role of gender suggest that it depends on the variables being used to model the longitudinal relationships. For example, in some of the studies in

which gender differences were found, rumination was used as a cognitive vulnerability. Girls have been found to ruminate more than boys and this has been a consistent finding in studies investigating rumination and depression (Nolen-Hoeksema, 2012). In contrast, gender differences in PF have not been a common finding when compared to the larger number of studies that have found gender differences in rumination.

Overall, the results of this study contribute to a more specific understanding of the role of PF in the emotion generation process model. It can be said that specific emotions determine when a vulnerability/ER processes (i.e. PF in this case) will exert its effects on an emotion, irrespective of valence of the emotion. These findings are consistent with findings that emotion regulation develops in an emotion-specific manner (Zimmerman & Iwanski, 2014). The varied relationships between PF and specific emotions are consistent with the differential emotions theory (DET; Izard, 1997) the appraisal theories (Lazarus, 1991), and the different emotional responses that go beyond the dimensional level (i.e. negative and positive emotion) (Roseman, 2001). According to Izard (1997), each emotion has a different evolutionary function and the different characteristics of each emotion are likely to influence when and how each emotion is regulated. The appraisal theory posited that patterns of appraisal for each emotion is different and is connected with goal-directed action which in turn leads to different emotional responses that may be adaptive or maladaptive (Lazarus, 1991; Roseman, 2001).

The exploration of specific emotions has also provided further clarification for the argument of whether emotions and ER are facets of one factor or are two distinct factors. Moreover, the findings of the current study render support to prior evidence in which different emotions were found to have different emotional responses (Roseman, 2001).

The results of this study have provided a clearer explanation for whether emotions and emotion regulation should be considered as one factor or as two factors. Campos et al. (2004) argued that emotions and emotion regulation are likely to be facets of a single factor while other researchers have suggested that emotions and emotion regulation are clearly two distinct factors (e.g. Cole et al., 2004; Gross & Barrett, 2011; Thompson, 2011). A clear cut distinction between a one factor model and a two factor model cannot be determined due to the varied

relationships between PF and emotions in this study. However, the relationship between PF and some emotions (e.g. sadness and shame) could possibly indicate that emotions and ER can be said to be a one factor model as the emotions preceded ER. When an emotion precedes ER, the emotion can possibly be said to be regulating as it influences any subsequent responses or reactions (Campos et al., 2004). In contrast, the relationship between PF and other emotions (e.g. fear, hostility, and joy) indicate that emotions and ER could possibly be two distinct factors as PF was a precursor to one emotion (i.e. hostility), had a reciprocal relationship with another emotion (i.e. fear), and both PF and the emotion (i.e. joy) did not significantly influence the other longitudinally.

The predictive status of PF with regard to PSS has further illuminated the relationship between intrapersonal ER and interpersonal ER. Marroquin (2011) had proposed that intrapersonal ER (i.e. PF in this study) is likely to be influenced by interpersonal ER (i.e. PSS). However, in a study conducted to investigate the influence of emotional competencies and PSS on help seeking behaviour, emotional competencies were still considered important in explaining help seeking behaviour even when the adolescents reported high levels of PSS (Ciarrochi et al., 2003). The findings in this study lend further support to the studies conducted by Ciarrochi and colleagues and provide a more conclusive understanding of the link between intrapersonal ER and interpersonal ER. Emotional competencies are not only important in determining help seeking behaviour but they are also important in explaining how adolescents perceive people in their social support network and derive satisfaction from their social supports. It seems that as an intrapersonal ER variable, PF, to a certain extent, can explain the hesitation in soliciting social support when it is most needed. Implications for the different relationships between PF and each emotion and PF and the amount of and satisfaction with social support are discussed below.

7.1 Longitudinal Relationships between Psychological Flexibility, Specific Emotions and Perceived Social Support

7.1.1 PF as a Precursor

The predictive status of PF supports previous research that suggests that PF acts as a generalized psychological vulnerability (Forsyth et al., 2003; Kashdan et al., 2006). People who are high in PF are usually more accepting and have more attentional resources for engaging in behavioural options that are personally and socially adaptive. When people are low in PF, there is a tendency to engage in cognitive behaviours that attempt to control and avoid psychological events and therefore thoughts and emotions are prevented from being processed and understood. Moreover, attentional resources become narrowed and people are unable to look outside for further guidance in order to select a helpful or more adaptive course of action. Avoidance efforts culminate in preventing people from living their lives with purpose and meaning. Consequently, individuals with low PF tend to suffer from affective, cognitive, and social deficits that can lead to psychological distress and reduced positive functioning.

7.1.1.1 *PF and Hostility*

PF was found to predict hostility in this study. It appears that those adolescents who were low in PF at Time 1 were likely to become increasingly hostile at Time 2. Prior research on anger, which shares characteristics with hostility, indicate that the expression of anger is usually internalized or directed towards the self (anger-in) or away from the self (anger-out) (Spielberger, Reheiser, & Sydeman, 1995). Internalized anger often involves the suppression or denial of the emotion in order to prevent its outward expression within a social context (Shipman, Zeman, & Stegall, 2001). Suppression paradoxically increases the importance, frequency, or intensity of the very content that is being avoided and can result in unfavourable social consequences such as the involuntary display of angry facial expressions, physical gestures, or aggressive movements (Boulanger et al., 2010). In conclusion, PF acts as a

psychological vulnerability in relation to hostility and decreases in PF are likely to contribute to increases in hostility.

The predictive relationship between PF and hostility can be viewed from the original vulnerability stress model that states that all people have certain levels of vulnerabilities that predispose them to any psychological problems (Ingram & Luxton, 2005). Low PF could be acting as a vulnerability factor for hostility in this study. This is the first study (to the knowledge of the researcher) to show that levels of PF (as a psychological vulnerability) predict hostility longitudinally. Prior research has mainly attributed harsh parenting, parental hostility, and socialization in the family as determinants of hostility (Kerr & Schneider, 2008; Lewis, Collishaw, Thapar, & Harold, 2014).

Additionally, gender did not moderate the relationship between PF and hostility. Gender differences were expected as boys are known to be more hostile than girls (Hart, 1999). In other longitudinal research where gender differences were examined, girls were more prone to anger and boys were more prone to hostile attribution in relation to child-to-parent aggression (Calvete, Gamez-Guadix, & Garcia-Salvador, 2014). Furthermore, no significant mean differences were found between boys and girls for hostility. It seems unclear as to why gender differences were not detected at the single variable level and also when modelled longitudinally with PF. Further gender studies investigating hostility and ER are warranted in order to make more definitive conclusions.

7.1.1.2 PF and PSS

PF was also found to be a precursor of the perceived amount of and perceived satisfaction with social support. Those who were low in PF reported a smaller network size and less satisfaction with social support one year later. Individuals who tend to avoid private events, will also tend to avoid interactions with people (Boulanger et al., 2010). Regardless of the kinds of resources provided by the social support network, engagement in experiential avoidance makes people avoid other people and situations due to factors such as fear of negative evaluations (as found in social anxiety; Tull & Gratz, 2008). Avoidance eventually leads to a

range of other problems such as loneliness, an inability to contact positive events, and confirmation of previous beliefs that one is socially inept (Kashdan et al., 2013). From an RFT perspective, people become ineffective because they are unable to contact direct environmental contingencies from where feedback can be received and awareness can be obtained in order for behavioural modification to occur accordingly.

Other predictors of PSS, such as self-esteem and personality-relationship transaction quality, have been found to be reliable predictors of perceived social support satisfaction and network size in adolescents over the long term (Asendorpf & van Aken, 2003; Marshall et al., 2014). Although self-esteem and relationship quality are important individual characteristics, the practical utilisation of these variables to improve social support is questionable. For example, interventions for boosting self-esteem are largely ineffective (Baumeister, Campbell, Krueger, & Vohs, 2003). The reason for this may be that increasing self-esteem (or improving relationship quality) also depends on a host of other factors such as the ability to self-regulate emotional responses with corresponding behaviours in socially adaptive ways (Trentacosta & Shaw, 2009). The PF construct works as key self-regulatory processes and the current findings that PF predicts PSS provides added value in prevention and intervention programs. Programs that seek to increase PSS should also seek to increase PF levels as it is increasingly being supported by research (Hayes et al., 2006; Ruiz, 2010).

7.1.2 Emotion as a Precursor

When an emotion is a precursor of PF, then PF processes are likely to be used as strategies for coping when those emotions are elicited. It can also be said that PF processes perpetuates or exacerbates the experience of those emotions. The SEM results were consistent with the argument that emotions and ER are facets of a single process as the experience of sadness and shame preceded response tendencies. These findings are supportive of the claim by Campos et al., (2004) that emotions can determine the regulation strategy or strategies used to respond to an emotion. PF processes have mainly been viewed as a psychological vulnerability and have been assumed to precede psychological symptoms due to its development in early

childhood (Lipkens, Hayes, & Hayes, 1993; Roche, Barnes-Holmes, Smeets, Barnes-Holmes, & McGeady, 2000). Additionally, accumulated research from the stress and coping literature has also shown that depressive symptoms can be a precursor to cognitive vulnerabilities in normal adolescent populations (Calvete, 2011; Garber, Keiley, & Martin, 2002). Similarly, in another longitudinal study that examined cognitive style and depression in adolescents, it was found that early symptoms of depression predicted the development of negative coping styles which in turn have predicted further increases in depressive symptoms (Nolen-Hoeksema et al., 1992). By extension, the experience of certain emotions can be a precursor to psychological vulnerabilities.

7.1.2.1 PF and Sadness

With regard to sadness, increases in sadness may drive adolescents to withdraw from the external world in an attempt to avoid the expression of sadness (Zeman & Garber, 1996). Children learn from a young age that outward displays of sadness are unacceptable in comparison to more acceptable displays of anger when provoked by peers (Dodge, Pettit, McClaskey, & Brown, 1986). Likewise, displays of intense experiences of physical pain are more acceptable than sadness or anger (Zeman & Garber, 1996). Withdrawal from the outward expression of emotions can increase the intensity of the emotion internally (Fuchs & Thelen, 1988). The external use of avoidance to restrict the expression of sadness can also transfer to the internal use of avoidance as a means of coping with sadness internally (Boulanger et al., 2010). When an emotional expression is suppressed, the frequency and intensity of the emotion is paradoxically amplified in the internal world (Feldner, Zvolensky, Eifert, & Spira, 2003). According to RFT, when thoughts and beliefs are suppressed in the presence of a negative emotion, the relational network expands in a way that additional links between the thought and emotion are introduced in the form of cues. Because of the bidirectional principle in RFT, the psychological functions of thoughts will evoke the psychological functions of emotions and vice versa. In the case of sadness, RFT would suggest that attempts to control or suppress sadness will strengthen the links between sadness and associated cognitive appraisals such that when

sadness appears or rebounds, the unwanted thoughts will also appear. The experience of sadness in the past may have already become associated with a predisposition to cope by avoiding internal experiences and therefore the attempt to control, alter, or withdraw has already become tightly intertwined with sadness. Consequently, the frequency and intensity of sadness tends to self-amplify.

The implication of the relationship between sadness and PF is that persistent sadness and/or recurrent sadness could possibly contribute to other possible negative indicators such as reduced emotional reactivity as seen in depression (Blumberg & Izard, 1986; Rottenberg & Gross, 2003). Additionally, sadness and its accompanying appraisal of loss are usually considered a central theme in depression (Roseman & Kaiser, 2001). Moreover, when sadness is regulated by withdrawing, then there may be reduced or delayed help-seeking behaviour because of the low awareness of the detrimental effects of the emotional state (Judd, Rapaport, Paulus, & Brown, 1994).

Gender differences were found mainly at the single variable level. Significant mean differences were found between boys and girls with girls found to have higher levels of sadness than boys. These findings are similar to findings from past research in which girls tended to express and exhibit more sadness than boys (Fuchs & Thelen, 1988; Zeman & Garber, 1996). However, in the current study, although there were gender differences for sadness, gender did not moderate the relationship between PF and sadness longitudinally.

7.1.2.2 PF and Shame

The relationship between PF and shame in this study are somewhat consistent with another longitudinal study in which avoidant-coping fully mediated the relationship between shame and depressive symptoms in adolescents (De Rubeis & Hollenstein, 2009). Shame-proneness is especially prominent during adolescence as this developmental period is characterized with excessive focus on the self in terms of being worthless, powerless, small, and exposed (Lewis, 1995; Tracy, Robins, & Tangney, 2007). Coping with shame often entails withdrawing from a situation but can also extend to withdrawals from internal experiences due

to its painful nature. The findings in the present study are consistent with the model presented by Muris and Meesters (2014) where two levels of appraisal of shame are relevant: the primary appraisal and the secondary appraisal. The primary appraisal of shame is closely linked with identity and is an appraisal of social acceptance or rejection. Exaggerated and intense shame make people want to avoid the feeling and the associated situation because it is closely aligned with the individual's global perception of self-worth and makes them feel vulnerable to the outside world (Lewis, 2007; Tangney & Dearing, 2002). Withdrawal and avoidance are natural responses for cutting off exposure to the external world for the purpose of hiding vulnerabilities. When shame is experienced, adolescents may cope by engaging in cognitive fusion and experiential avoidance. The emotion shame involves an attachment to a conceptualized self that can be dysfunctional. For example, feelings of shame that one is incompetent can become a belief that one is globally incompetent. This is an indication of engagement in cognitive fusion. The global feeling of incompetence can become fused with a conceptualized self and discrepancies between the real self and ideal can become the focus of attention. In this way, the fusion with a conceptualized self can become globally pervasive and can influence the way one conducts his/her life. The external avoidance of a situation may lead to the avoidance of the experience of shame internally due to feelings of discomfort. Consequently, these feelings do not get resolved. Experiential avoidance actually serves to exacerbate the problem and prevents the emotion from being processed and understood. Feelings of shame are likely to become more intense and frequent owing to the bidirectional principle in RFT and attempts to suppress or control them. Heightened feelings of shame can be so painful that the emotion is likely to be substituted with emotions such as sadness, anger, or hostility and after a prolonged time period, severe forms of sadness, anger, and hostility can manifest as depression (Heaven, Ciarocchi, & Leeson, 2009; De Rubeis & Hollenstein, 2009).

The secondary appraisal of shame involves reacting in relation to the social environment. These reactions are highly dependent on the relationship between the past and present context in which shame has been experienced and includes individual characteristics such as temperament and gender (Muris & Meesters, 2014). The secondary appraisal of shame-

prone to shame is particularly relevant in adolescence because of the increasing shift away from socializing within the family and the increasing affiliation with peers. Feelings of wanting to hide from observers are considered a safeguard against being viewed in a negative light and against future rejections. Shame is often experienced as how “others” perceive and evaluate them and therefore this imposition on the self is tied to values and standards of a particular audience. Feelings of shame are often bypassed through defensive and avoidant behaviour and manifests as dysfunctional behaviour that can ultimately take the form of psychopathology.

Shame-proneness has been shown to be associated with the use of avoidant coping strategies irrespective of gender (De Rubeis & Hollenstein, 2009). Similarly, no differences between boys and girls were found in the longitudinal relationship between PF and shame in the current study. However, significant mean gender differences were found for shame alone, with girls reporting considerably higher levels of shame than boys. Past research has found that girls are more prone to shame due to physical changes and body image concerns (Rudolph et al., 2006).

7.1.3 Reciprocal relationship between PF and emotions

The relationship between PF and fear was found to be reciprocal. The reciprocal relationship is consistent with other models of stress in which cognitions and emotions reciprocally influence each other over time (Hankin & Abramson, 2001). The reciprocal relationship between PF and fear indicates that a decrease in PF predicts an increase in fear. Similarly, an increase in fear predicts a decrease in PF. This cycle of mutual influence can also be understood in terms of a process in which the intensity of an emotion increases when greater unwillingness to experience the emotion is already present. The verbal/cognitive appraisal of the emotion increasingly dominates the ability to contact other meaningful aspects of the emotion (i.e. the adaptive purpose of the emotion) or distance oneself from evaluations that are rooted in historical feelings, interactions, sensations, thoughts, perceptions etc. (Stewart, Villatte, & McHugh, 2012). As fear increases, it is likely to have a counter influence in the form of greater amounts of unwillingness to experience fear and therefore PF and fear mutually

influence each other. In other words, the reciprocal relationship between PF and fear is likely to be reflected as a fear of fear. A test of differences in the predictive strength between the cross-lagged paths (PF to fear vs. fear to PF) was performed and causal priority was established with PF being a stronger predictor of fear. The greater strength in the path from PF to fear implies that when adolescents are already low in PF, they tend to be more fearful towards events or circumstances that elicit fear and this in turn feeds back into the loop that makes them more psychologically *inflexible* (emphasis added).

The adaptive function of fear experiences often results in a flight or fight response which initially involves avoiding or escaping circumstances that is assessed as actually harmful. If the situation does not afford an avoidance response, then the only alternative left is to fight. A fear experience is avoided even more with the addition of verbal threat information (Davey, 1997; Field & Schorah, 2007). Essentially, when cognitive/verbal information predominates in fear, there is a possibility that fear can give rise to anxiety. The continuum from fear to anxiety involves physiological responding and avoidance and is separated by the occurrence of the actual event (Beck, Emery, & Greenberg, 2005). When a person describes their anxious behaviour and circumstances, it also involves associations between private verbal stimuli (e.g. negative self-evaluations, judgmental social comparisons etc.) and bodily sensations (e.g. physiological arousal) that make it even more aversive. From an RFT perspective, verbal information that already has a threatening quality can be transformed further and take on an even more threatening meaning due to possible instances in the historical past/context in which fearful events led to disastrous consequences. In other words, when fear is associated with cognitive fusion, there is often an excessive use of avoidance or escape responding due to the aversiveness of private events (Friman, Hayes, & Wilson, 1998).

Findings of the reciprocal relationship between PF and fear lends further support to earlier correlational research between PF and anxiety-related disorders (Hayes et al., 2006; Kashdan et al., 2006; Roemer, Salters, Raffa, & Orsillo, 2005; Tull et al., 2004). Furthermore, the stronger effects of the path from PF to fear also provides further insight about PF as an individual vulnerability in predicting fear and by extension in predicting anxiety-related

problems. In particular, the fear of fear and anxiety sensitivity has been indicated in panic disorders, GAD, and social anxiety (Roemer, Salters, Raffa, & Orsillo, 2005; Tull et al., 2004; Tull, Rodman, & Roemer, 2008).

Gender did not moderate the relationship between PF and fear longitudinally. At the single variable level, significant mean gender differences were reported for fear. In particular, girls reported higher levels of fear than boys. This is consistent with prior research in which gender role orientation seem to influence the experience of fear in girls more than in boys (Ginsburg & Silverman, 2000; Muris et al., 2005). More specifically, boys are expected to be courageous and brave and therefore displays of fear are often discouraged (Ollendick et al., 1995).

7.1.4 No relationship status

The findings between PF and joy indicates that even though the constructs are moderately correlated cross-sectionally ($r = .33$), they do not predict each other longitudinally. The non-predictive relationship between PF and joy suggests that the two constructs seem to vary independently of each other over time. There is no evidence from the results that changes in one precede changes in the other. There may be a few explanations for the lack of a longitudinal relationship. The first explanation can be taken from research in the area of positive psychology. Two central concepts in positive psychology are subjective well-being (the balance between positive and negative affect and life satisfaction) and psychological well-being (having meaning and purpose in life including autonomy, personal growth, acceptance etc.). The two factors are different as each have distinct factor structures even though they are correlated (Keyes, Shmotkin, & Ryff, 2002). A similar comparison can be made between joy and PF in the current study. Although the present study did not measure subjective well-being and psychological well-being directly, the positive and negative emotions represented an aspect of subjective well-being and PF represented an aspect of psychological well-being (i.e. acceptance and its opposite avoidance). Joy and PF correlated with each other but they seem to be different constructs and have the potential to influence psychological outcomes differently.

To gain an understanding of the relationship between PF and positive emotions, the relationship between positive and negative emotions needs elaboration. In past research, positive and negative emotions have often been shown to be related to each other via the regulation of negative emotions. Essentially, while suppressing and avoiding negative emotions, positive emotions are also likely to be suppressed and prevented from the realm of awareness (Kashdan et al., 2013; Kashdan & Rottenberg, 2010). However, several emotion theorists have hypothesized that negative and positive emotions operate differently and that this also extends to their independent regulation (Diener, Lucas, & Oishi, 2002; Russell & Carroll, 1999). In support of this assertion, studies in adults have demonstrated that negative and positive emotions were independent predictors of physical health (Pressman & Cohen, 2005) and adaptive functioning (Fredrickson, 2002). Additionally, research is also accumulating to support the separate role that positive emotions (the lack of it) play in psychopathology (Gruber, Oveis, Keltner, & Johnson, 2011; Kashdan, 2007; Rottenberg, Gross, & Gotlib, 2005).

Research investigating the relationship between positive emotions and ER is still in its nascent stages and therefore a precise role of the relationship between them in psychopathology is still unclear. For example, Kashdan et al. (2013) found that both low PF and diminished positive emotional experiences were independent predictors of social anxiety disorder but in the same study, the presence of experiential avoidance did not only lead to less negative emotions on a daily basis but also led to deficits in the experience of positive emotions. The researchers attributed the findings to biased attentional processing that inhibits access to reward stimuli in the presence of negative emotions and therefore deficiencies in experiencing positive emotions were also observed. In conclusion, PF and positive emotions can be said to be independent of each other but there could be an indirect longitudinal relationship between them. While PF processes influence the experience and processing of negative emotions and are also influenced by them directly, the absence of a significant longitudinal relationship between PF and positive emotions could be indirect and via the influence of the suppression of negative emotions. In other words, PF processes can be said to influence positive emotions in the presence of negative

emotions, however, in the absence of negative emotions, PF processes are likely to be unrelated to the regulation of positive emotions.

7.2 Strengths and Limitations

This study has several advantages. Longitudinal studies help to advance knowledge of the interaction between risk and protective factors and improve the quality and certainty of findings. The current study has contributed significantly to the existing research by clarifying the role of specific emotions in determining mindful emotion regulation, irrespective of valence of the emotion. Additionally, the varied relationships between discrete emotions and PF, has contributed to more clarity of the role of specific emotions in determining where mindfulness and acceptance variables are likely to occur in the emotion generation process model.

Nevertheless, there were several notable limitations in this study. The first is concerned with self-report studies involving emotions and ER. Dampened affect and/or its intensity is likely to influence the self-report of emotional experiences and self-reports of ER strategies used. Those who experience higher levels of negative affective are most likely to suppress and avoid those experiences and as a result they may not be aware of how they are responding to their emotional experiences. Some adolescents in this study may have responded while experiencing emotional distress, however, structural equation modelling analyses control for such situational or person-situation interactions (Finkel, 1995).

A second limitation regarding the emotion variables in the study is that only one traditional positive emotion, joy, was included in the study and therefore no comparisons among different types of positive emotions were possible. There is a possibility that other kinds of positive emotions may be associated with PF over time. However, high correlations among positive emotions, for example joy and happiness, suggest that they are less differentiated and have often been used as substitutes (Weiner, 1985).

Third, limitations with regard to the measurements used are also relevant. Although the PANAS-X has adequate psychometric properties, it has predominantly been used for the purpose of measuring the higher order factors of positive and negative affect. Theoretically

based measures of discrete emotions (e.g. differential emotions theory and appraisal theories of emotions) are more specific and better distinguish between highly correlated emotions such as shame and guilt or anger and hostility. However, these measures are also longer and due to time constraints, more pure and elaborate measures of discrete emotions were not practical.

Additionally, although the AFQ-Y has been shown to be psychometrically sound, the AFQ-Y has not been used as extensively as the adult versions, such as the AAQ and AAQ-II. The association between the AFQ-Y and other measures of avoidance or acceptance (apart from the AAQ and AAQ-II) are still not known.

Fourth, despite the advantages of longitudinal research designs, there are some limitations in the current study. First, only two time points have been used in the current study and the causal structure for the relationship between the variables cannot be determined with certainty. In other words, a pattern of variances and covariances is hard to gauge (Cole & Maxwell, 2003). Associations between variables accumulate slowly over time and they may strengthen or weaken over time dependent upon individual dispositions or environmental experiences. The current study only provides a snapshot of the dynamic processes between PF and different emotions and PF and PSS between two time points in the space of 12 months. Second, causality can be implied mainly from longitudinal data; however, the reciprocal relationship found in the current study does not provide a clear direction of a causal chain of events. Although findings of reciprocal relationships are consistent with theory and findings from other longitudinal studies, there is still a lack of understanding with regard to the initial causal point that may have originated at an earlier point in time. There could have been other omitted or unmeasured variables that may have actually caused the two variables being modelled to covary, thus giving the perception of causality (Little, Preacher, Selig, & Card, 2007). But to a certain degree, the potential for the influence of a third variable was mitigated due to SEM that controls for measurement error, correlated errors, and disturbances (Finkel, 1995). Measurements of variables do not occur in a vacuum as they involve characteristics of the situation that people being measured are involved in but the advantage of latent constructs is that versions of the trait-like variable can be obtained by controlling for measurement error, or

in other words, omitted or unmeasured variables (such as the situation or person-situation interactions on the occasion of testing) that may have influenced the actual variable being measured (Steyer, Schmitt, & Eid, 1999). Moreover, an analysis of the full cross-lagged panel controls for measurement error, correlated errors, and disturbances, which theoretically mitigates any influences of unmeasured or omitted variables. Additionally, the 1-year gap between measurements allows for sufficient time to observe trait-like characteristics of the variables or any other notable changes to the trait-like characteristics.

7.4 Theoretical Implications and Future Research

7.4.1 Theoretical Developments

The current study has advanced theoretical knowledge at several levels. First, this study has provided insight on the relationship between a mindful ER variable and emotions and the relationship between intrapersonal and interpersonal ER. Second, more specific relationships between psychological vulnerabilities, specific emotions, and perceived social support have been clarified. Third, the magnitude of correlations and the longitudinal relationships between PF and specific emotions have provided some clarification that the PF measure possibly assesses psychological processes rather than just negative affect. In the ensuing paragraphs, the theoretical implications are organized based on the levels mentioned above as theoretical level implications are also tied to the implications at the variable level. First, emotions and ER are discussed, followed by intrapersonal and interpersonal emotion regulation.

The findings in this study are most consistent with the differential emotions theory (DET; Izard, 1997) and the appraisal theories (Lazarus, 1991; Roseman, 1984). DET states that each emotion has a different function and therefore emotional responding is likely to be different. Similarly, the appraisal theories suggest that each emotion has different effects on cognition, physiology, and behaviour. The finding that some emotions with the same valence are regulated differentially provides additional evidence (as proposed by Izard, 2010) for the notion that specific emotions are important in determining ER processes. However, the

variations found in the relationship between each emotion and PF also suggests that it cannot be conclusively determined whether emotions and ER processes are two separate constructs or different facets of a single process. Campos and colleagues argued that ER and emotions are different facets of a single process. The suggestion by Campos and colleagues that emotions are regulated as well as regulating is most consistent with the findings of this study. In contrast, the findings are also consistent with suggestions by other researchers that ER and emotions represent a two-factor model (Gross & Barrett, 2011). The pattern and magnitude of correlations between PF and negative and positive emotions were not high enough as to suggest that they were assessing the same underlying construct.

This study has further strengthened the argument for examining discrete emotions as proposed by a consensus of emotion researchers in a survey conducted by Izard (2010). Theoretical debates between models of emotion are ongoing with some emotion researchers favouring a discrete emotions model and others in favour of a core affect system model (see Barrett, 2006, for review). Barrett (2006) questioned the utility in examining discrete emotions because there have been empirical inconsistencies found for each emotion component and because the disconfirming evidence was more consistent. Instead, Barrett (2006) proposed that emotions have an underlying general affect system called the core affect system. In contrast, other researchers claimed that the inconsistencies may have largely been due to artefacts of the research design and the influence of other processes (e.g., the presence/absence of the intensity of the emotion) rather than the discreteness of each emotion (Cacioppo et al., 2000; Roseman, 2008). An important argument made in favour of the discrete emotions model was that varied ER strategies are used to manage emotions and that it is likely that each discrete emotion is regulated differently (Izard, 2010). To a large degree, the findings in this study confirm that it is important to investigate discrete emotions as the different relationships between PF and each emotion has shown that discrete emotion determines when it is regulated or when it regulates, irrespective of valence of the emotion.

The current study has also contributed somewhat to elucidating the discriminant validity of the measurements used to measure the PF construct. The AAQ and AAQ-II are adult

versions of measurement for the PF construct and have not been used in this study but the AAQ-II has been shown to be highly correlated with the AFQ-Y (Fergus et al., 2012; Schmalz & Murrell, 2010). The AAQ has been shown to lack discriminant validity especially with regard to negative affect. A recent study has shown that when a factor analysis was performed using the PANAS and the AAQ-II, the pattern of correlations were identical for the two scales thus questioning the discriminant validity of the AAQ-II and by extension the PF construct (Wolgast, 2014). However, in the study, the higher dimensional levels (i.e. positive and negative affect) were used for the analyses. The current study, to a certain extent, has provided some clarification as to whether the PF construct is different enough in relation to negative affect. In the current study, instead of combining all negative emotions into one negative affect variable, different negative emotions were modelled separately with the AFQ-Y. Correlations between the AFQ-Y and negative emotions were in the medium to large range ($r = .30$ to $r = .54$). Although the correlations are considered moderately high, they are not high enough to conclude that the AFQ-Y and negative emotions are measuring the same underlying construct. Hemphill (2003) provided some guidelines for interpreting the magnitudes of correlation coefficients based on published results of psychological assessments from 380 meta-analytic studies. The correlation coefficients were found to be relatively evenly distributed in thirds where one third was less than .20, another third was between .20 and .30, and the last third was above .30. In this analysis, Hemphill (2003) tried to provide an empirical basis for Cohen's (1988) original guidelines for interpreting the magnitude of effect sizes in the order of .10 as small, .30 as medium, and .50 as large. The magnitude of correlation coefficients between PF and each emotion in this study ranged from .30 to .54. Most of the correlations were in the moderate range. Correlation coefficients of the same underlying construct are usually expected to be at the level of .80 and above.

Apart from statistically-based evidence, the distinctness of the PF construct and negative affect can also be gauged from the different relationships between PF and each negative emotion. PF was a precursor of one emotion, two emotions were a precursor of PF,

and PF had a reciprocal relationship with another emotion. The differences in the relationships between PF and emotions of similar negative valence suggest it is capturing more than just negative affect (Gloster et al., 2011). Moreover, the structural overlap between the AFQ-Y and the PANAS-X can be said to be minimal as the PANAS-X is a measure that contains words rather than sentences. Furthermore, with regard to the findings between PF and joy, the non-predictive association between the variables support previous theoretical assumptions that in the presence of positive emotions, people can still exhibit inflexibility, while in the presence of negative emotions, people can respond more flexibly (Kashdan & Rottenberg, 2010; Schmaltz & Murrell, 2010).

The results also provide an advanced understanding of PF processes in relation to the continuum between well-being and psychopathology. In the past, PF has predominantly been investigated in cross-sectional studies. Cross-sectional studies typically indicate that there is a relationship between variables but are unable to confirm more definitively as to how they may be related and how the relationship between variables may have an effect on well-being and psychopathology. In contrast, longitudinal studies can provide a more precise understanding of the relationships between variables and offer important insights on how variables can influence each other from the perspective of their risk and protective profiles. The longitudinal design of this study has provided additional confirmation that the PF construct can potentially act as a psychological vulnerability and can also perpetuate psychological processes that have already been set in motion. For example, cross-sectional studies have shown that low PF is a correlate of many negative psychological outcomes but the direction of these relationships has not been determined before. Given that both negative affect and PF have been found to be associated and are established risk factors for negative psychological outcomes, the longitudinal design of the current study has provided a clearer picture of reciprocal relationships between PF and each specific negative emotion. This knowledge is important for maximizing the effects of interventions when designing prevention and treatment programs (Kraemer et al., 2001). It can be said that when people are low in PF, they may be more likely to experience fear and hostility. Likewise, in the presence of low PF, adolescents are likely to perceive low social support which

in turn can affect interpersonal relationships and hinder help seeking behaviours. In these cases, interventions that target PF processes will be effective. The precursor status of PF is also consistent with prior research suggesting that low PF is a psychological vulnerability (Kashdan et al., 2006).

Furthermore, people who experienced sadness and shame have been shown to experience fusion between private events associated with these emotions. This is likely to lead to coping by avoidance or suppression of internal experiences. The predictive role of emotions in this study can be viewed from the perspective of the response styles theory proposed by Nolen-Hoeksema (2004). According to the response styles theory, when individuals experience certain emotions, they are likely to respond by using coping strategies that can contribute as a maintaining factor for future emotional difficulties beyond the effects of initial biological and psychosocial stressors. For example, children and adolescents may experience sadness and shame but these emotions have the potential to escalate into clinically significant psychological disorders due to ER processes. Emotion regulation processes, such as low levels of PF, are likely to act as maintaining factors for sadness and shame. It can be concluded that the kind of ER strategies employed can potentially become maintaining factors for psychological symptoms.

In this study, the proposed view that PSS was possibly a precursor of intrapersonal ER was not found. Marroquin (2011) proposed that social support could be viewed as an interpersonal ER variable and is possibly a precursor of intrapersonal ER. According to this model, intrapersonal ER is influenced by social interactions and relationships (Campos et al., 2011). However, in this study, PF was found to be predictive of PSS and is therefore more consistent with the findings of Ciarrochi and colleagues (2003). These researchers found that emotional competencies (various intrapersonal ER variables) were deemed more important in determining help seeking behaviour even at higher levels of PSS in adolescents aged 14-15 years (Ciarrochi et al., 2003). There are several plausible explanations for the findings being contrary to the interpersonal ER model of Marroquin (2011). The first explanation is that the

effects of social interactions and relationships in the family on intrapersonal ER may have already occurred in childhood. In other words, intrapersonal ER may be the result of emotion socialization during childhood. Secondly, in adolescence intrapersonal ER may be a more dominant means of coping whereas seeking support may be a secondary level of coping. In childhood, the caregiver regulates or attempts to regulate emotions for the child, but adolescents are capable of regulating their own emotions as a result of cognitive development.

7.4.2 Future Research

While this study focused on investigating PF and discrete emotions, more longitudinal studies are needed in order to investigate the role of PF processes and its positive and negative consequences in the longer term. This was a snapshot of only two time points and perhaps a longer time frame (many waves of data) with appropriate time lapses in between measurement points should be considered for exploring potential emotional feedback loops. It is likely that once an emotion is triggered and the regulation of these emotions commences, the shaping of emotional behaviour takes place. Once the behaviour is learned and enters the behavioural repertoire, an individual may gradually learn to anticipate behaviours that will up-regulate or down-regulate emotions, thus forming a feedback loop (Baumeister, Vohs, DeWall, Zhang, 2007).

Another direction that may be worthwhile investigating is the mediating or moderating effects of PF and emotions on psychological outcomes in a multi-wave longitudinal study. The differentiation between discrete emotions and PF could be examined further with outcome variables such as biological and psychosocial stressors, emotional reactivity, psychological well-being, and psychopathology. In cross-sectional mediational studies, the effects of being low in PF have contributed further to negative social, physical, and psychological outcomes above and beyond the direct effects of the stressor (Boulanger et al., 2010; Greco et al., 2008). Future studies should examine the role of PF as a maintaining factor in psychopathology. In addition to outcome variables, more empirical studies are required to examine discrete emotions and PF by using emotion measures that have clear theoretical bases and construct boundaries

and guidelines for appropriate use. For example, the blurred boundaries between anger and hostility have produced inconsistencies in interpreting and understanding the role of these emotions in well-being and psychopathology. Measures such as the STAXI-2 (Spielberger, 1999) and the MMPI-2-Anger Content Scale (Butcher et al., 1989) for instance are clearly distinct from hostility and are well-normed measures used in clinical and non-clinical settings. Similarly, other measures of psychological vulnerability that are highly correlated with the AAQ and AFQ-Y should also be considered in order to distinguish between the contribution of the PF construct and other similar measures. For example, measures such as the fear of anxiety, anxiety sensitivity, distress intolerance, and other avoidance measures can help clarify pathways to psychopathology and at the same time aid in distinguishing between PF processes and other psychopathological vulnerabilities.

In addition to examining PF and emotions, perceived social support can also be included in the model as the association between different emotions and perceived social support is still unclear. According to the stress-vulnerability framework, emotions and their dysregulation contribute to disease and ill health along with concurrent deficiencies in social support (Broadhead et al., 1983; Lazarus & Folkman, 1984). With some clarity gained about the reciprocal relationships between PF and emotions, a broader picture could be obtained on adolescent functioning and well-being by examining interactions between PF, emotions, and perceived social support. For example, hostile attitudes in adolescents are strongly related to decreased perceptions of family support and therefore, further investigations could be conducted to determine the role of PF in the relationship between hostility and social support.

In the current study, only one positive emotion was examined and therefore it would be worthwhile exploring the relationship between PF and other positive emotions. Investigations of the function of positive emotions in light of the broaden and build theory (Fredrickson, 1998, 2001), the approach motivation theory (Gable & Harmon-Jones, 2008), and the reward-related states theory (Berridge, 2003) have mainly been examined in adults. Models that describe and explain the functions of positive emotional states are also highly applicable in adolescents and may provide insight on adolescent well-being and some of the risk behaviours relevant in

adolescent development. In particular, the dysregulation of positive emotions is marked by deficits in or low levels of positive emotions, imbalances between the experience of positive and negative emotions, the inability to differentiate between high approach and low approach motivation emotions, or elevated reward-seeking and sensation-seeking tendencies (Gilbert, 2012). Additionally, other mediating or moderating variables of the relationship between PF and positive emotions should also be explored as the presence of negative emotions seem to dampen the experience of positive emotions. Other positive psychological indicators such as savouring (Bryant, 1989), problem-focused coping (Folkman & Moskowitz, 2000), temperamentally capable of recruiting positive emotions (Lyubomirsky, Sheldon, & Schkade, 2005), and resilience (Tugade & Fredrickson, 2007) could possibly act as mediators or moderators.

7.5 Summary and Conclusion

Adolescence is a challenging time with biological and social changes potentially disrupting emotional and social well-being. Trends towards more negative emotions over the one year period were observed but these did not reach significance, although a significant decrease in the experience of positive emotion (joy) was observed. Mid-adolescence is a time when adolescents typically report higher levels of negative emotions and lower levels of positive emotions (Henker et al., 2002; Larson et al., 2002). Likewise, deficits in social well-being are experienced when perceptions of the availability of social support decreases. Adolescents in this study reported significant decreases in their perceived social network but non-significant decreases in perceived satisfaction with social support.

Both negative and positive emotions and PSS are known risk and protective factors in adolescence. Emotion regulation has been identified as a potent risk factor in the development and maintenance of well-being and psychopathology. Psychological flexibility is increasingly being viewed as a mindful ER variable and low levels of PF can also be considered a risk factor for emotional and social well-being in adolescents. The relationship between different risk and protective factors is increasingly being considered important for understanding psychological

difficulties and their persistent influence in psychopathology. The findings in this study suggest that PF is a psychological vulnerability (precursor) as well as a coping style for different negative and positive emotions. PF was also found to be a predictor of perceived social support. The varied findings of the longitudinal relationships between PF and each emotion and between PF and PSS have added to the theoretical understanding of the relationship between ER processes and emotion theories and between intrapersonal and interpersonal ER.

This research is novel in its use of a longitudinal cross-lagged panel design for developing a more detailed understanding of PF as a construct that measures ER processes. All three variables are known to represent modifiable risk and protective factors in adolescents and therefore the direction of influence is an important first step in identifying which processes should be targeted in prevention and intervention programs for adolescents. Mindfulness-and-acceptance-based therapies are a promising treatment modality for adolescents. PF can be improved when individuals engage in mindful and accepting behaviours (Hayes et al., 2006). As PF increases, greater awareness and insight is gained and individuals become more adept at directing behaviours towards increasing quality of life in the longer term (Hayes et al., 2006).

Appendices

Appendix 1: Youth Experiences Survey and Demographic Information

University of Wollongong



YOUTH EXPERIENCES 4

Dear Student,

Some of you may remember the surveys you completed for us in 2003, 2004, and 2005. Over this time you have helped us better understand what young people think and do. We would appreciate it if you will continue to share your thoughts and feelings with us. This survey will take about 50-70 minutes to complete.

We would like to invite you to share your views with us about a range of issues that affect young people: attitudes to school and family, your expectations about the future, and your attitudes to fellow students. Students will also be asked to nominate other students who show specific positive (e.g. kind and friendly) behaviours. The information you provide **will be used for research purposes only and not normally given to the school**. Information will only be passed on to the school in exceptional circumstances. Please do not write your name or address on the survey. Your questionnaire has a code that allows us to match this year's survey with ones you did earlier. We also plan to match your questionnaire answers with your school grades later this year. We track students by code and not by name.

All information provided will be treated in the strictest confidence. You can withdraw from this survey at any time, and this will not be reported to the school. Simply answer each question on the survey without discussing your answer with anyone else.

If you have any concerns or complaints regarding the way the research is or has been conducted, you can contact the Ethics Officer, Human Research Ethics Committee, University of Wollongong on (02) 4221 4457 or your Year coordinator.

Thank you for your help.

Associate Professor Patrick Heaven

Associate Professor Wilma Vialle

Dr Joseph Ciarrochi

Dear Student,

Because we intend to survey you again next year, we need to match your Year 10 and Year 11 questionnaires. Remember that your individual answers are intended for research purposes only.

To help us, please write your **name** here: _____

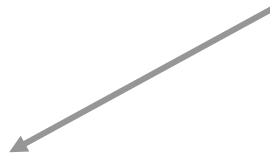
Now detach this page from the rest of the questionnaire. Your teacher will collect it.

DO **NOT** WRITE YOUR NAME ON THE REST OF THE QUESTIONNAIRE.

NOTE: Please ignore any pale grey text like this in the box below throughout the questionnaire. It is just to help us put together the information later.

University use only

SN



PART 1

Please provide us with the following background information:

1. Which school do you attend? (Please circle a number below):

1. St Joseph's, Albion Park
2. Magdalene College
3. St John's, Nowra
4. John Therry High School
5. Holy Spirit College
6. Mt Carmel

2. What is your sex? (Please circle the correct number): 1) Male 2) Female

3. What is your birth date? _____(day)_____(month)_____(year)

4. What is the **initial** of your first name? _____

5. What is the **initial** of your last name/surname? _____

6. What is the **initial** of your mother's first name? _____

7. Are your biological parents presently:

- 1) *Married* 2) *Separated* 3) *Divorced* 4) *Other*

8. Do you intend continuing with school next year in Year 11?

- 1) **Yes**, I intend to continue with school next year
- 2) **No**, I intend to complete my schooling at the end of Year 10

9. How old are you this year? _____ years

10. What is your religious faith? (Please circle a number below)

- 1) Catholic 2) Protestant 3) Muslim 4) Jewish 5) Other 6) None

University use only

SN					
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Please turn over

University use only

1. school
2. sex
3. dob (ddmmyy)
4. code
5. code
6. code

Appendix 2: Action and Fusion Questionnaire for Youth (AFQ-Y)

We want to know more about **what you think, how you feel, and what you do**. Read each sentence.

Then, circle the number that tells how true each sentence is for you.

	Not at all True	A little True	Pretty True	True	Very True
1. My life won't be good until I feel happy					
2. My thoughts and feelings mess up my life	0	1	2	3	4
3. The bad things I think about myself must be true	0	1	2	3	4
4. If I feel sad or afraid, then something must be wrong with me	0	1	2	3	4
5. I don't try out new things if I'm afraid of messing up	0	1	2	3	4
6. I must stop thoughts and feelings that I don't like	0	1	2	3	4
7. I stop doing things that are important to me whenever I feel bad	0	1	2	3	4
8. I must get rid of my worries and fears so I can have a good life	0	1	2	3	4
9. I do worse in school when I have thoughts that make me feel sad	0	1	2	3	4
10. I can't be a good friend when I feel upset	0	1	2	3	4
11. I am afraid of my feelings	0	1	2	3	4
12. I do whatever I can to make sure I don't look dumb in front of other people	0	1	2	3	4
13. I try hard to erase hurtful memories from my mind	0	1	2	3	4
14. I wish I could have a magic wand to make all my sadness go away	0	1	2	3	4
15. If my heart is beating fast, something must be wrong	0	1	2	3	4
16. I can't stand to feel pain or hurt in my body	0	1	2	3	4
17. I say things that make me sound cool	0	1	2	3	4

Appendix 3: Positive and Negative Affect Scale (PANAS-X)

*Below are words that describe different **feelings and emotions**. Read each word and indicate to what extent you have felt this way during the past month. If a word describes you a lot, circle 5. If it does not describe you at all, circle 1. Just pick a number that you think best describes how you have felt over the last month.*

	Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
1. Afraid	1	2	3	4	5
2. Scared	1	2	3	4	5
3. Frightened	1	2	3	4	5
4. Nervous	1	2	3	4	5
5. Jittery	1	2	3	4	5
6. Shaky	1	2	3	4	5
7. Angry	1	2	3	4	5
8. Hostile	1	2	3	4	5
9. Irritable	1	2	3	4	5
10. Scornful	1	2	3	4	5
11. Disgusted	1	2	3	4	5
12. Loathing	1	2	3	4	5
13. Sad	1	2	3	4	5
14. Blue	1	2	3	4	5
15. Downhearted	1	2	3	4	5
16. Alone	1	2	3	4	5
17. Lonely	1	2	3	4	5
18. Happy	1	2	3	4	5
19. Joyful	1	2	3	4	5
20. Delighted	1	2	3	4	5
21. Cheerful	1	2	3	4	5
22. Excited	1	2	3	4	5
23. Enthusiastic	1	2	3	4	5
24. Lively	1	2	3	4	5

Appendix 4: Social Support Questionnaire (SSQ)

The following questions ask about people in your environment who provide you with help or support. Each question has two parts.

*For the first part, list all the people you know, excluding yourself, whom you can count on for help or support in the manner described. Give the person's **initials** and their relationship to you (e.g. brother, sister, close friend, mother, etc.). Do not list more than one person next to each of the numbers for each question. For some questions you may be able to list more people than for other questions.*

For the second part, circle how satisfied you are with the overall support you have. If you have no support for a question, circle the words "no one", but still rate your level of satisfaction. Do not list more than nine persons per question. Try and answer each section.

LOOK AT THE EXAMPLE BELOW:

(Do not fill in the question in this box)

Who can you trust with information that could get you into trouble?

(This student lists three people: school counsellor; a friend; a brother, mother)

No one	1) T.N. (counsellor)	4) mother	7) _____
	2) L.M. (friend)	5) _____	8) _____
	3) J.J (brother)	6) _____	9) _____

How satisfied are you with this support?

(This student is fairly satisfied, so circles 5)

6 – very	5 – fairly	4 – a little	3 – a little	2 – fairly	1 – very
satisfied	satisfied	satisfied	dissatisfied	dissatisfied	dissatisfied

Now please answer the following questions as best as you can:

Question 1

a. Who do you feel really appreciates you as a person?

No one 1) _____ 4) _____ 7) _____
 2) _____ 5) _____ 8) _____
 3) _____ 6) _____ 9) _____

b. How satisfied are you with this support?

6 – very	5 – fairly	4 – a little	3 – a little	2 – fairly	1 – very
satisfied	satisfied	satisfied	dissatisfied	dissatisfied	dissatisfied

Question 2

a. Who can you count on to help you out in a crisis situation, even though they would have to go out of their way to do so?

No one 1) _____ 4) _____ 7) _____
 2) _____ 5) _____ 8) _____
 3) _____ 6) _____ 9) _____

b. How satisfied are you with this support?

6 – very	5 – fairly	4 – a little	3 – a little	2 – fairly	1 – very
satisfied	satisfied	satisfied	dissatisfied	dissatisfied	dissatisfied

Question 3**a. Whose lives do you feel you are an important part of?**

No one 1) _____ 4) _____ 7) _____
 2) _____ 5) _____ 8) _____
 3) _____ 6) _____ 9) _____

b. How satisfied are you with this support?

6 – very	5 – fairly	4 – a little	3 – a little	2 – fairly	1 – very
satisfied	satisfied	satisfied	dissatisfied	dissatisfied	dissatisfied

Question 4**a. Who can you really count on when you need help?**

No one 1) _____ 4) _____ 7) _____
 2) _____ 5) _____ 8) _____
 3) _____ 6) _____ 9) _____

b. How satisfied are you with this support?

6 – very	5 – fairly	4 – a little	3 – a little	2 – fairly	1 – very
satisfied	satisfied	satisfied	dissatisfied	dissatisfied	dissatisfied

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