# How Regulatory Responses to Negative Emotion Are Related to Adolescent Mental Health: A Longitudinal Investigation

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B. Psych Science (Hons)

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A thesis submitted on March 21st 2016

in fulfilment of the requirements for the award of the degree

Doctor of Philosophy

Australian Catholic University

Institute of Positive Psychology and Education

# Certification

This thesis contains no material published elsewhere or extracted in whole or in part from a thesis by which I have qualified for or been awarded, another degree or diploma.

No parts of this thesis have been submitted towards the award of any other degree or diploma in any other tertiary institution.

No other person's work has been used without due acknowledgement in the main text of the thesis.

All research procedures reported in the thesis have received the approval of the relevant Ethics Committee (where required) or a relevant safety committee, where the matter is referred to such a committee.

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# Statement of Authorship

In all matters pertaining to authorship contributions regarding the three pieces of work intended for publication, I certify that I, Loch Forsyth, was the majority contributor.

The extent of collaboration by each of the authors listed on the three major pieces of work within this thesis, is represented by a percentage figure that follows the title page of each of these works.

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# Acknowledgements

In acknowledgement of her enduring support throughout the four years of my PhD studies, I dedicate the completion of this thesis to my partner Nicole. Her willingness to relocate interstate while remaining a strong source of encouragement throughout the whole process is a testament to her strength and character.

To my supervisors Professor Joseph Ciarrochi and Dr Philip Parker, thank you for giving me the chance to undertake Higher Degree Research and for overseeing this PhD project. Your commitment to providing supervision, in challenging circumstances, will be one of the strongest memories I take from this candidature.

Of course I wouldn't be in the position I am today without the support and friendship that I have been lucky enough to receive throughout the years. Thank you to Dr Angus McLachlan who, many years ago, accepted me as a student into a Bachelor of Psychological Science program. Your decision to do that changed the trajectory of my life and ultimately allowed me to progress to Higher Degree Research. The support I received from you and from other staff at Federation University (formerly the University of Ballarat) all contributed to inspiring me to complete my doctoral level studies. I also wish to acknowledge Professor Suzanne McLaren, Dr Petah Gibbs, Dr Megan Jenkins, Dr Peter Gill, and Dr Louise Hayes, who have all at various times throughout the last ten years been generous with their time and shared their experiences with me.

I wish to acknowledge Dr Robert Proctor, Dr Avram Babovic, and Cheryl Ludwik, who have all been friends and significant supporters of mine. I will seek to emulate your exemplary levels of professionalism throughout my own career.

To my family, I thank those of you who have proved to be sources of encouragement during the times when I needed it most. Those who messaged and emailed me at various stages of my candidature were always a welcome distraction. I thank you all for your understanding for all of the birthdays, Christmas's and special occasions I have missed over the past years due to my studies. I lastly thank Maxamus, who was with me at the very start of this journey; even though you have passed, your memory remains with me.

# Table of Contents

# List of Tables

# List of Figures

# Abstract

This thesis investigates the multidimensional construct of emotion regulation (ER) and its relationship with adolescent mental health. It used the Process Model as a theoretical framework to understand the stage of regulation being measured. The focus was on how adolescents regulate their negative emotions with flexibility and acceptance and how such behaviour is related to their mental health. This thesis consists of introductory chapters that cover the theoretical foundations and models of ER utilised in this thesis. These introductory chapters also present the possibility that influences such as social support may effect ER in adolescence. Three chapters intended for publication follow the introductory chapters of this thesis. The first of these chapters is a systematic review focussed on ER self-report measures that have previously been used in empirical studies with adolescent samples. The completion of the systematic review confirmed a paucity of longitudinal research that focussed on ER in adolescence. The review illustrated the differences between the multiple self-report tools and highlighted that they are not measuring regulation in a comparable manner. The completion of the systematic review also directly informed the selection of the Difficulties in Emotion Regulation Scale for the empirical components which followed in the thesis (DERS; Gratz & Roemer, 2004). The chapters that followed consisted of Empirical Study 1 that involved a large population of adolescents in a two time point longitudinal design ($N$ = 2,070; males = 1,019, females = 1,051). Structural equation modelling (SEM) was used to test if ER predicted change in mental health, mental health predicted change in ER, or whether they were reciprocally related. Analyses from the first empirical study broadly supported the reciprocal influence model. Final analysis using exploratory structural equation modelling (ESEM) identified that regulating upsetting emotions by engaging in goal directed behaviour when upset was the most reliable antecedent to change in well-being and mental health. The following

chapter intended for publication consisted of the largest empirical study undertaken as part of this thesis. Empirical Study 2 built on the previous study by utilising a three year, longitudinal design. A large population of adolescents ($N$ = 2,070; males = 1,019, females = 1,051) was utilised. Empirical Study 2 tested for direct effects of social support on ER and mental health, as well as investigating any mediational relationships between the latent variables. The final results found no support for mediation between the latent variables. Strong reciprocal relationships between ER and mental health that were observed in Empirical Study 1 were also confirmed as being present in Empirical Study 2. Social support from either peers, parents, or teachers was not found to influence adolescent's ER. Parental and, to a lesser extent, teacher social support, was found to significantly predict improved mental health across three years. The final chapters of this thesis explored the contributions and important implications which have arose from the completion of the systematic review and two empirical studies. These include understanding that difficulties regulating negative emotions are not a unique risk factor for poorer mental health in adolescents. Rather ER difficulties and poorer mental health share a reciprocal relationship. Goal directed behaviour was consistently found to be the most important of these regulatory responses across both empirical studies. Social support was not found to support an adolescent's ability to regulate their negative emotions, although higher levels of social support from parents and teachers predicted significant improvements in mental health across three years. Suggestions for future research directions and understandings surrounding the process of ER which include the flexibility of ER strategy selection and regulatory profiles in adolescents were made

# Chapter 1 Introduction to Thesis

## 1.1 Preamble

Emotions are felt throughout all domains of our lives. What these emotions are, and how we experience them, may help determine the quality of our lives (Ekman, 2007). For some, the inability to deal with emotions can lead to difficulties, whereas being able to regulate our emotions effectively is widely reported as having a positive effect on our well-being (Bloch, Moran, & Kring, 2010; Werner & Gross, 2010). This is perhaps why emotion regulation (ER) has been described as one of life's greatest challenges (Gross, 2002). The regulation of emotions is especially relevant for the developmental period of adolescence. This is because adolescence is characterised by heightened emotional arousal and rapid psychological and physical development (Ciarrochi, Leeson, & Heaven, 2009; Gilbert, 2012; Keyes, 2006). If emotion regulation (ER) difficulties develop in adolescence, the potential exists for ongoing psychological and social problems later in life.

Increasingly, empirical research suggests that difficulties in regulating emotion are linked to the development and continuation of psychopathology in adolescence (Bradley, 2000; McLaughlin, Hatzenbuehler, Mennin, & Nolen-Hoeksema, 2011). Investigating how the process of emotion regulation (ER) is related to the healthy development of adolescents is a major goal of this thesis. Many children transition to adolescence and then adulthood without experiencing significant psychological issues (Parker, Lüdtke, Trautwein, & Roberts, 2012; Steinberg & Morris, 2001). A concerning number of young people however, find that the developmental journey throughout adolescence coincides with a rise in psychological difficulties (Costello, Copeland, & Angold, 2011), in which the inability to effectively regulate emotions may be a contributing factor throughout this time.

Adolescents have been found to experience their emotions differently from adults and children (Riediger & Klipker, 2014). They experience more negative emotions more frequently, react strongly to emotion-eliciting situations, and fluctuate more rapidly within emotional states (Larson, Moneta, Richards, & Wilson, 2002; Riediger, Schmiedek, Wagner, & Lindenberger, 2009; Riediger, Wrzus, & Wagner, 2013; Steinberg, 2014; Stroud et al., 2009). The regulation of emotions during adolescence has also been identified as being unique to this developmental stage compared with others (Gross, 2014). The regulation of emotions by adolescents must therefore be considered and investigated separately.

Research focussing on the construct of ER has enjoyed broad popularity (see Figure 1; Gross, 2013). The rapidly increasing interest in ER in the past two decades is depicted in Figure 1.

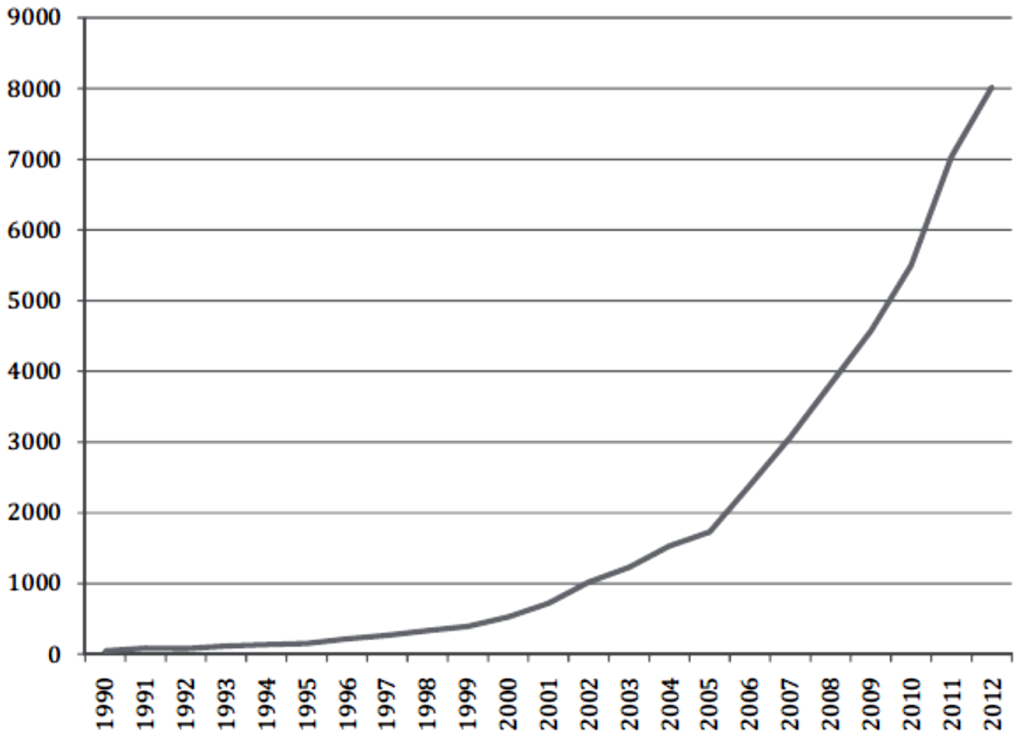


*Figure 1.* The Popularity of Emotion Regulation. Number of publications containing the exact phrase "emotion regulation" in GOOGLE SCHOLAR from 1990-2012 (as published in Gross, 2013). Note: this is not a cumulative plot. Permission to reproduce granted by Guilford Publishing (Appendix A).

This dramatic increase in the study of the regulation of emotions has come to be titled the affect revolution (Adrian et al., 2011; Tangney & Fischer, 1995). This popularity has led to ER being described as taking centre stage in the field of developmental psychology (Eisenberg, Champion, & Ma, 2004). Even with such attention and recognition much is still unknown about whether difficulties regulating emotions presents as a unique risk factor to mental health, or is a consequence of poorer mental health. This is because ER's role in adolescent development and mental health has been understudied (Adrian et al., 2011; Neumann, van Lier, Gratz, & Koot, 2010).

Broadly, ER has been described as a range of skills and strategies for modifying one's response to emotional reactions (Tangney & Fischer, 1995). Contemporary understandings suggest that a failure to regulate or regulate appropriately, is associated with poorer psychological, social, and physiological outcomes (Gross, 2014; Gross & Levenson, 1997). Emotion regulation (ER) however is a complex process; which will be explored and described at length at a later stage of this thesis. This thesis acknowledges the exponential growth in ER research but notes that much of this focus has been on populations other than adolescents (Neumann, van Lier, Frijns, Meeus, & Koot, 2011). This is unfortunate, as Silk, Steinberg, and Morris (2003) describe adolescence as an ideal time to examine ER. They point to the physical, social, and psychological transitions in this period, and the maturation of many of the neural, hormonal, and cognitive systems thought to underlie regulation. Finally, they point to the rise in psychopathology throughout the years of adolescence. Understanding the role ER plays across adolescence may therefore help us to understand how poorer mental health develops and is maintained in adolescence.

## 1.2 Outline of Thesis

This thesis is structured as a PhD by publication and adheres to the presentation format specified by the Australian Catholic University (Supplementary Material A). In essence, this means that the thesis consists of a balance of chapters outlining and discussing the unifying research questions and themes of the research, and chapters based on papers intended for publication. The introductory chapters lead into three main bodies of work intended for publication (a systematic review and two empirical studies). The final thesis chapters discuss the major contributions made by this thesis and their implications for the field. Each of the chapters intended for publication is connected with transition statements aimed at guiding the reader through the overarching themes.

An outline of each of the thesis chapters will now follow. Chapter 1 has introduced the growing popularity which surrounds the construct of ER and the importance of understanding its relationship with mental health in adolescence. Chapter 2 serves as a broad introduction to the historical and philosophical discussion of emotion and its regulation. The core features of the contemporary understanding of ER are then explored. Chapter 3 establishes a clear definition and understanding of the process of ER, that forms the theoretical and empirical backbone of this thesis. The dominant theoretical models of ER are also outlined, to clarify the different stages and dimensions of regulation that will be measured by this thesis. Chapter 4 focusses on how the process of ER may be affected by external influences within the adolescent's social context. The proposed role that social support from parents, teachers, and close friends may play in supporting an adolescent's ability to regulate their negative emotions as well as influence their mental health is then covered.

Chapter 5 represents the first of the three major pieces of work within this thesis. "Assessing emotion regulation: A systematic review of self-report measures for use in

adolescent populations" uses the knowledge presented in the introductory chapters to survey the measurement of ER. It reviews current self-report measures of ER as well as their use in the empirical literature; the results directly inform the selection of the measure that will be applied in the empirical investigations that follow. Chapter 6 is the first of the two major empirical studies comprised within this thesis. It investigates the nature of the relationship across time, between ER, mental health and well-being and helps clarify whether ER is a risk factor, a reciprocal construct, or the consequence of mental health and well-being.

Chapter 7 represents the largest empirical investigation within this thesis: a three-year longitudinal study which aims to test two theoretical models. Direct effects and mediation models are compared to see if ER mediates social support and mental health, or if both ER and social support have their own unique direct effects on mental health. Chapter 7 marks the culmination of the empirical investigations contained in this thesis. Chapter 8 summarises the major contributions of this thesis and contrasts them with the prior knowledge held by the field. Chapter 9 covers the implications of the thesis findings for ER theory and research. Suggestions are made for the applications of these findings, and future considerations for the field.

# Chapter 2 Emotion and its Regulation

## 2.1 Background of Emotion Regulation

The term emotion regulation (ER) is one that suffers from much definitional ambiguity. This is reflected by the different theoretical approaches which mutually inform the measurement and interpretation of all regulation research. As a multidimensional construct, the definitions and understandings of ER throughout the literature are varied (Cisler & Olatunji, 2012). As a result, Cole, Martin, and Dennis (2004) stipulate that researchers should explicitly state their working hypothesis of ER. The following sections are aimed at understanding the sophisticated process of ER, and at distinguishing it from related constructs so as to reduce ambiguity. The chapter concludes with the selection of the ER definition that this thesis will use to inform its understanding and subsequent empirical investigations.

Gross and Thompson (2007) seek to distinguish between emotions regulating something else, such as physiological responses or behaviour (regulation *by* emotions), and emotions themselves being regulated (regulation *of* emotions). This thesis seeks to investigate the effects of the latter, which can be described as the heterogeneous set of processes used to regulate the emotion experience (Gross & Thompson, 2007). Furthermore, to reduce ambiguity, from this point forward the term *emotion regulation* (ER) is used in preference to others, such as *emotion dysregulation*, except where such terms are explicitly used in their original format and are considered essential to understanding a theory or research finding.

Perhaps the most widely accepted and all-encompassing definition of emotion regulation is that of Thompson (1994), who defines ER as “the extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions,

especially their intensive and temporal features, to accomplish one's goals" (p. 28). A well-adjusted individual from this perspective is considered emotionally well-regulated, and can attenuate and curtail the intensity and duration of an experienced emotion, while exercising their ability to amplify and extend emotion states when need be (Cole, Michel, & Teti, 1994). Furthermore, Thompson's (1994) enduring definition suggests that external factors may also influence an individual's incentives and abilities to regulate their emotions. However, not all approaches to ER emphasize the attenuation or curtailing of the emotional experience. Therapeutic approaches such as Acceptance and Commitment Therapy (ACT) for instance, emphasises the monitoring of emotion rather than its down-regulation, and encourage responding flexibly across a variety of contexts (Hayes, Strosahl, & Wilson, 2012; Valdivia-Salas, Sheppard, & Forsyth, 2010).

Emotion perceived as negative is largely associated with psychopathology (Kring & Sloan, 2010). How an individual regulates such emotions may contribute to the degree of suffering experienced by mentally ill individuals. Emotion regulation (ER) difficulties are implicated in over half of the DSM-IV Axis 1 disorders, and in all of the Axis II disorders (Gross & Levenson, 1997). Feelings of anger, sadness, and frustration are part of the human condition (Hayes et al., 2012) and, from a regulation standpoint, it is not necessarily the presence of a negative emotion that is the problem but rather, how that emotion is regulated which has informed the study of ER. From a clinical point of view the identification of how one regulates negative emotions is of high importance. Researchers and clinicians wish to be able to identify which ER processes are not working well and are problematic so that they can intervene effectively through treatment or intervention (Bloch et al., 2010). Investigating this question over time is essential if researchers wish to conclusively identify whether aspects of ER are risk factors which result in poorer well-being and mental health.

Distinguishing emotion regulation from emotion by drawing distinctions between the two, is a challenge for theoretical approaches and empirical research (Gross, 2013; Gross & Barrett, 2011; Izard et al., 2011). It is also critical for the reader to understand where emotion finishes and its regulation begins. The following subsections seek to clarify the definitional confusion associated with ER. This is achieved firstly by examining how emotions have come to be understood and defined, which allows for the theoretical demarcation between emotion and its regulation.

## 2.2 The History of Emotion and its Philosophical Foundations

Many today still wrestle with William James's (1884) famous question "What is an emotion?" (p. 188). Consideration of the role that emotions play in our lives and how they may be related to states of mind and health can be traced back more than two thousand years (Rottenburg & Gross, 2003). Lazarus (1991, p. 820) has described emotions as being representative of the "wisdom of the ages" and this is especially the case when considering those who have pondered the nature of emotions throughout history. Today, especially in western culture some emotions such as happiness are seen as more desirable (Lewis et al., 2008). In times past, Aristotle distinguished between some emotions as being more adaptive, if expressed in the right way, and having the potential to be maladaptive when expressed or experienced in the wrong ways for inappropriate durations. Aristotle further spoke about the role that context may play in the expression of emotions such as anger, and its situational appropriateness (Solomon, 2008). These ancient insights would appear to suggest an understanding even then that emotions may be context dependent and may also be experienced both rapidly and spontaneously. Further, Aristotle advocated the release of repressed emotions or passions as a means of treating and understanding mental illness (Cicchetti, Ackerman, & Izard, 1995). This represents some of the earliest attempts at considering how the role of emotions could be related to treating mental illness.

Indications of the idea that *regulation* and *emotion*, may be both separate but related phenomena can be observed at various times throughout the history of the philosophy of emotion. The Stoic philosopher Epictetus recommended that people should control their emotions by first controlling their thoughts (Epictetus, 2004). This suggested an awareness of the connection and influence of the mind in relation to the experience of emotion. This self-awareness is also reflected by Descartes (1649/1989) who stated that everyone already possesses experience of what he referred to as the "passions" within oneself.

It is perhaps in the last century that the focus on how people respond to their emotions through regulation has intensified more than before. For example, William James (1884) concluded that emotions were response tendencies which could be modulated. The Father of psychoanalysis Sigmund Freud argued for the theory that emotions were able to be repressed by individuals (Freud, 1988/1926). Repression was one of many defence mechanisms at the time considered to be adaptive regulatory approaches (Aldao, Sheppes, & Gross, 2015). The perspectives of both James and Freud represent an awareness of human behaviour as being able to curtail or regulate emotion by means such as modulation and repression. Both methods may be viewed as cognitive style regulation strategies that were perhaps considered most consistent with the psychological zeitgeist of the time for dealing with painful thoughts and emotions. Existentialist philosopher Sartre (1948) described emotion as a phenomenon that could be strategically applied: he characterised emotions as strategies we utilise as a means of avoiding action and responsibility (Sartre, 1948). As a result, Sartre's views of emotion and the actions associated with them suggest a regulation element that is behavioural and conscious. These earlier views on emotion may at times not clearly distinguish emotion from its regulation. This is also probably exacerbated by the lack of a common language consisting of shared technical terms and

experiences. However, they do suggest an understanding of a connection between the mind and emotion, and of how the environment may be influenced by this experience.

It has been demonstrated in this section that philosophical inquiry into emotions, as well as their regulation and their relationship to mental health, has an impressive lineage. The questions of what are emotions and what are their functions, has been pondered by great thinkers since the times of ancient Greece. The search for a thorough understanding of emotion however has remained elusive and it was not until contemporary times that consistent themes were identified regarding the nature of emotion. The following section builds on the philosophic background of emotions in exploring contemporary understandings of emotion and how it is related to similar constructs.

## 2.3 What are Emotions? A Contemporary Perspective

The target of the regulation process is the emotion itself; discussions of emotion regulation (ER) and emotional disturbances often presuppose an understanding of what an emotion actually is (Rottenberg & Gross, 2003). The previous section has illustrated just how difficult this task is, and how many great thinkers have wrestled with the question and purpose of emotions. As a result, it is essential to understand adequately what an emotion is, prior to undertaking research which focuses on the process of its regulation (Gross & Thompson, 2007). As demonstrated in the previous section, the study of emotions is vast in its scope and history (Cicchetti et al., 1995; Darwin, 1998/1872; Matt, 2011). The following section confines itself to an examination of contemporary understandings of emotion and will contrast them with related constructs where appropriate.

Historical descriptions of emotions have encompassed both the inward and outer experience (Solomon, 2003). This trend is still present in current times and, while emotions may be categorised as internal or external experiences, they should not be understood as occurring in isolation from each other. Emotions may be experienced as subjective internal

experiences, biological and neurological occurrences or behavioural displays reflected in the voice and in facial expressions (Ekman, 2007; Gross, 2014; Matsumoto, Frank, & Hwang, 2013). Research has explored the connection between external displays of emotion and corresponding internal experience.

An example of this is the emotion of anger. The outer experience of anger can be observed in varying intensities as a facial expression characterised by eyebrows being drawn together, tensed lower eyelids, raised upper eyelids, and a tightening of the lips (Ekman, 2007). Meanwhile, the internal experience of anger includes physiological changes such as increased heart rate, increased respiration, and cortisol deployment (Ekman, 2007; Lewis et al., 2008; Matsumoto et al., 2013). Individuals may also report subjective feelings which describe the sensations associated with experiencing the emotion of anger.

Emotion displays have also been shown to lead to a contagion of emotion expression and internal experience in others (Hatfield, Cacioppo, & Rapson, 1994). People have often been found to be susceptible to specific moods and emotions. Experimental research has found that people smile when viewing pictures of others smiling (Achaibou, Pourtois, Schwartz, & Vuilleumier, 2008). Studies in naturalistic settings have also shown that other people's emotions influence their peers' emotions as well as individual appraisals (Parkinson & Simons, 2009). This suggests that an individual's emotion experience has direct ramifications both for themselves and for those around them. This means that emotions have a social dimension and are not simply a response to stimuli, but can be experienced within a social milieu (Payne, 2015). In an adolescent's environment, that can consist largely of interactions with parents, teachers, and peers (Steinberg, 2014). Likewise, the behaviour of any of these individuals may also have a strong bearing on an adolescent's emotional behaviour.

The complex nature of emotion, as proposed by contemporary psychology, encompasses many domains of our lives. Evolutionary theorists have emphasised the adaptiveness of emotions as contributing factors which help to keep us safe. They ideally do this by helping us learn how to interact with our environment, and to respond behaviourally in an adaptive manner when faced with a threatening environment (Ekman, 2007). At the social level, emotions can help individuals communicate their needs, relate to others and find and form friendships (Hatfield et al., 1994; see Lewis et al., (2008) for a comprehensive review).

Campos, Frankel, and Camras (2004) define emotion as follows:

> Emotion is the process of registering the significance of a physical or mental event, as the individual construes that significance. The nature of the significance (perceived insult, threat to life, deprecation by another, relinquishment of a desired state, avoidance or resolution of a problem, etc.) determines the quality of the emotion. The degree of perceived significance determines the magnitude of the emotional response, as well as its urgency. (Campos et al. 2004, pp. 379)

Campos et al.'s (2004) definition highlights an important aspect which is highly relevant to understanding the relationship between emotion and its regulation. If the quality of an emotion is consistent with a subjective state that is perceived as negative (or otherwise), then the successful regulation to that emotional response may allow the individual to respond to it effectively. The internal emotion experience, according to Campos et al. (2004), consists of registering and appraising an event which determines the degree of the experience and then the nature of the response. As a result ones relationship with their emotions and the subjective states associated with them has the capacity to influence how they respond.

**Emotion and Related Constructs**

Much of what has been presented here regarding emotion can also be argued as sharing some similarities with that of related constructs. As a result, it is helpful to briefly

move beyond solely defining emotion, and to also distinguish it from its related constructs. This is because a major issue with understanding the construct of emotion within the psychological sciences is its misuse and confusion with conceptually similar constructs (Ekkekakis, 2012; Lewis et al., 2008). The use of multiple terms to describe the same or similar phenomenon in emotion-based research has contributed to this confusion (Gross, 2014). This practice can be traced back to notable scholars such as Hume who used the terms passion and emotion interchangeably (Charland, 2012). Freud, and much of the early psychoanalytic literature, also often referred to emotion as "affects" (Gay, 1995; Solomon, 2003). The use of these terms interchangeably such as moods, affect, and emotion illustrates the need for these constructs to be defined and distinguishable from each other for the purposes of clarity.

Mood refers to enduring states that are not as easily expressed as an emotion (Lewis et al., 2008). Moods can therefore be expected to be experienced with an intensity less than that of an emotion but experienced for a longer duration (Ekkekakis, 2012). Gross (2014) defines moods as prolonged states such as depression and euphoria. According to Gross (2014), two key points can be used to separate an emotion from a mood. Firstly, moods can be viewed as being longer in duration than an emotion. Secondly, moods may not be directly related to the trigger of certain stimuli, as an emotion can be (Gross, 2014; Rottenberg & Gross, 2003). This has led some to consider moods as being temporally remote (Ekkekakis, 2012). It is therefore appropriate to use the term mood when referring to a prolonged and global state whose onset is not necessarily tied to a stimulus.

Another term often used synonymously with emotion is affect. Affect in contemporary psychology has been used to describe various aspects of the emotion experience as well as including some behavioural components of emotion (Buck, 1993; Gross, 2014; Rottenberg & Gross, 2003). Gross (1998) disagrees with this inconsistent use

of the term and argues that affect should be viewed as a superordinate concept at the top of all emotion-related terms. Figure 2 provides an illustrative example of emotion and its related constructs, as proposed by Gross (1998).

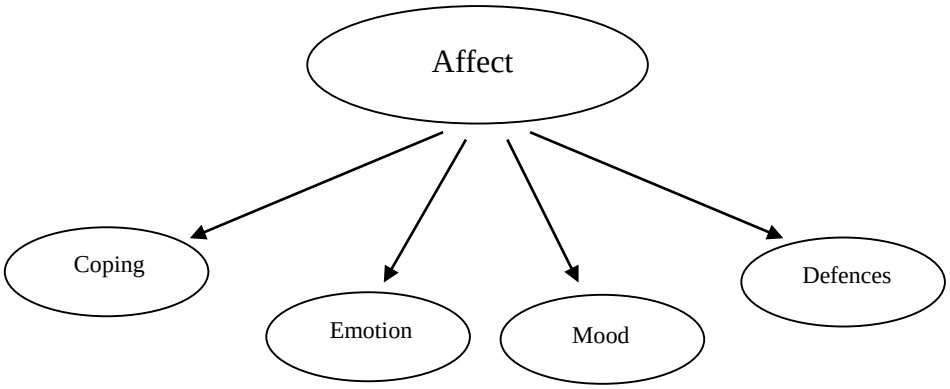


*Figure 2.* Hierarchical Model of Emotion and Related Concepts (Gross, 1998)

Affect, while considered by Gross (1998) as being a superordinate concept is still often thought to incorporate combinations of both emotion and mood (Ekkekakis, 2012; Lewis et al., 2008; Solomon, 2003). While it is undeniable that conceptual overlap may exist between these related constructs for the purposes of clarity each has been presented and discussed. Aside from this, it has also been addressed for another key reason. As previously noted, ER has proven a widely popular construct (Gross, 2013). Accurately understanding the properties of the construct that is being regulated and differentiating it from those that are related is essential. Getting the benefits from rigorous research demands that the appropriate literature is considered and the specific construct being measured is adequately defined and understood. This also includes acknowledging any conceptual similarities it may share with other constructs. For the duration of this thesis the term emotion will not be used interchangeably with any of these previously discussed terms, such as mood and affect.

Coifman and Bonanno (2010) believe that a further way of understanding emotion can be through the means which are used to study it. This suggests that ideally, measurement methods should reflect how researchers conceptualise emotion. For example, Coifman and Bonanno (2010) propose that dimensional or continuous understandings of emotion would be best served through assessment by self-report or using emotion checklists. In contrast, the measurement of physiological responses or coding of emotion displays in facial expressions would be consistent with that of an episodic or basic emotions approach. Coifman and Bonanno's (2010) insights appear sound; however, additional considerations such as theory, research aims, and constraints should also be recognised as helping to inform the selection of assessment methods used in emotion based research. Ekkekakis (2012) has proposed a three step approach which integrates both the key concerns surrounding construct ambiguity and appropriate measurement selection. Firstly, Ekkekakis (2012) recommends deciding whether the construct ones wishes to measure is an emotion, affect or mood. After this decision has been taken and the nature of the construct of interest has been clarified, the most appropriate conceptual model related to that construct should be selected for guiding the purposes of the planned study. Lastly, Ekkekakis (2012) recommends selecting the most psychometrically sound instrument which is based on the previously identified conceptual model.

Assessing the effects of emotion regulation (ER) in a large population of adolescents across time is a broad goal of the empirical components of this thesis. To accomplish this effectively, a longitudinal design utilising self-report questionnaires presents as the most appropriate means to measure change across time. The focus of this research is on emotion and its regulation specifically from an adolescent' perspective. Therefore, matters such as displays of emotion in the form of physiological behaviours, facial expressions, vocal tone, or any other related behaviour, are not the focus of this

thesis. Furthermore, while emotions have been identified as occurring either spontaneously or in relation to a stimulus, the specific *cause* of the emotion is another aspect of the emotion experience that is not focussed on in this thesis. While these are all very important aspects of emotion in their own right, this thesis will be concerned with the manner in which an adolescent reports regulating their negative emotions.

This section has determined that an emotion is different from its related constructs in duration, intensity, and outcomes. A conceptual model which highlights all of the key aspects of emotion is Gross' (2014) Modal Model of Emotion. The Model Model (Figure 3) identifies four key aspects of the emotion experience in a simplified form. It emphasises the process associated with registering an event where the emotional significance is appraised by the individual.

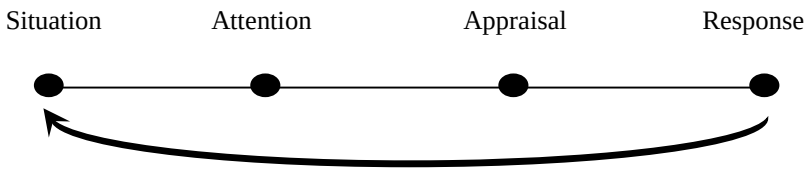


*Figure 3.* The Modal Model of Emotion (Gross & Thompson, 2007). Permission to reproduce this figure granted by Professor James J. Gross (Appendix B).

The first step consists of what is identified as a psychologically relevant situation. Gross (2007) says this situation phase, can be either internal or external, and is the initial trigger of the emotion. This situation could include witnessing something scary in one's environment or anger associated with a sudden realisation. Attention is then drawn to what has triggered the emotion, bringing an appraisal of what it means in light of an individual's goals. It is across this generation of the emotion that associated events may now occur: physiological, behaviour, and neurological expressions. The intrinsic experience of emotion is likely to be accompanied by physiological and expressive behaviours. The response stage of the emotion is marked by its ability to loop back and influence the

psychological relevant situation that first gave rise to the emotion. In the Modal Model of Emotion, it is at the response stage that an emotion can also have the ability to influence those within an individual's environment. This may include how someone acts or feels after immediately witnessing the expression of someone who is visibly sad or angry (Gross, 2007; Hatfield et al., 1994).

## 2.4 Emotion Regulation

The previous section has revealed emotions as being broad in scope but consisting of identifiable elements which occur across the generative process. As a result, depending on the nature of the emotional response that is experienced, some form of regulation is often required (Hughes, Crowell, Uyeji, & Coan, 2012). This regulation process has been proposed as acting to either down- or up-regulate the experienced emotion (Gross, 2014), while some regulatory approaches in contrast, have advocated the watching and monitoring of one's emotion-related experience, rather than trying to control it (Hayes et al., 2012; Valdivia-Salas et al., 2010). The various manner in which one may regulate their emotions has led to research efforts which seek to identify if some regulatory responses can be more effective than others (Gross, 2014; Kring & Sloan, 2010). This is especially the case with regulatory responses for emotions that are considered difficult or distressing. This is because emotions perceived as negative, are closely associated with psychopathology (Bloch et al., 2010; Kring & Sloan, 2010). Excessive negative emotion and unsuccessful attempts to regulate them have been associated with poorer mental health and psychopathology in adults (Werner & Gross, 2010).

The growth in the study of ER has been attributed to multiple schools of thought. These have included psychoanalytic, coping, and stress-based approaches (Aldao et al., 2015; Gross, 1998; Gross, 2014; Gross & Barrett, 2011; Phillips & Power, 2007). Prominent contemporary researchers have also noted how managing and regulating

emotions is an integral component of other popular constructs such as Emotional Intelligence (Salovey, Detweiler-Bedell, Detweiler-Bedell, & Mayer, 2008; Schutte, Manes, & Malouff, 2009). Clinical psychology has labelled regulation difficulties as being a core aspect of most psychopathology (Berking & Schwarz, 2014; Levenson, 1997). Whilst the importance of ER has been recognised within academia, understanding the mechanisms of change that are associated with ER still remains a persistent challenge (Cole & Deater-Deckard, 2009). This is especially the case when determining whether ER is a risk factor for psychopathology or whether difficulties in regulating emotion occur after the onset of psychopathology.

This thesis will examine how difficulties regulating emotion across a number of dimensions are related to adolescent mental health. The previous section has undertaken an extensive discussion on the construct of emotion. The current section now deals specifically with understanding the process of ER. The definitions, core features, and theoretical models of ER will all be presented and considered here.

Initial consideration regarding the process of ER suggests that it is a simple one, consisting of emotions being activated and individuals responding. This simplistic approach of ER may hold its origins in James's (1884) idea that emotions are response tendencies which are simply to be modulated. This two-factor approach to ER is still being debated as a means of understanding ER in contemporary psychology. Campos et al. (2004) critique this two-factor approach to understanding ER as not being comprehensive enough. They point out that endorsing a strictly emotion and response understanding of ER may be appealing but that this understanding is also flawed. Campos et al. (2004) argue that this is because one cannot be sure of measurement questions, such as "what is a pure emotion and when does it occur" (p. 378)? Kappas (2011) takes a similar viewpoint on emotion and the process of regulation, arguing that emotion doesn't just remain active until

a regulation process occurs to restore it to normal levels. These views on the process of ER suggest that any definitive understanding must embrace a construct that is both multifaceted and fluid. Another complexity associated with understanding the process of ER is the distinction between which elements of ER are understood as automatic and which are controlled ER responses (Compas, Jaser, & Benson, 2009).

The ambiguity surrounding the construct of ER, whose popularity has in many ways surpassed our understanding of it, can be further observed in the various terms used to describe it. As with the construct of emotion, the interchangeable use of terms such as mood regulation, coping regulation, and affect regulation are indicative of the confusion associated with the endeavour of establishing a definitive definition and understanding of ER (Bloch et al., 2010). Koole (2009) acknowledges that while ER can be separated from related regulation focussed constructs, similarly to the construct of emotion, conceptual overlap is often present. The following section is aimed at introducing and discussing what are considered as the core features of ER as proposed by Gross (2014).

## 2.5 Core Features of Emotion Regulation

For emotion regulation (ER) to be considered a unique construct, it should consist of core features and should have a strong theoretical foundation. Gross (2014), who has been at the forefront of studying ER for many years, has proposed three core features of ER which can be used to help define, understand, and distinguish it from related constructs. Each of these three features is presented and summarised in this section, and discussed in relation to what they mean for this thesis. This is followed by introducing a theoretical model of ER which integrates the core features of ER. The first core feature is that ER consists of a goal that individuals are trying to accomplish through its use. The second is the strategy that is utilised in order to achieve that goal. The third and final

feature is the outcome, that is the consequence one may experience as a result of using the selected strategy in order to accomplish the intended goal (Gross, 2014).

**Emotion Regulation Goals**

Emotion regulation (ER) is often employed with a goal in mind. Most frequently this goal can consist of decreasing a negative emotion (Gross, 2014). Conversely, it has been proposed that regulation strategies may also be employed with the goal of up- or down regulating a specific emotion (Gross, 1998; Gross & Thompson, 2007). This is a critical distinction which helps to separate ER from related constructs such as coping, as it suggests that ER may be used flexibly, depending on what goals it is intended to accomplish (Valdivia-Salas et al., 2010). What determines an individual's goals may also be influenced by the context in which an individual finds them-self. For example, if people are seeking to garner sympathy whilst experiencing the flu, they may not down-regulate the emotional effects of the illness in front of others. Thereby their goal of attracting sympathy may prove successful by the effects their unregulated emotional displays has on others. Likewise, someone who feels happiness and celebrates loudly in public, may curtail their visible expressions of emotion to achieve their immediate goal of not making a scene.

Emotions considered by the individual either as positive or negative may both be the target of up- and down-regulation, depending on the goal of the person. This key point also helps distinguish ER from the related construct of coping (Gross, 1998), because coping is a construct focussed more on the goal of dealing with enduring negative emotion only (Gross, 2014). Emotion regulation (ER), or at least the conscious aspect of the regulatory process, presents as a flexible process which can ideally be employed strategically across various experienced emotions so as to achieve different goals.

**Emotion Regulation Strategies**

Depending on the goal at hand, an individual may employ a range of regulation strategies to achieve their goals (Gratz & Roemer, 2004; Gross, 2014). Regulation strategies are many and, as will be explained later, may occur at various stages of the emotion cycle (Gross, 1998). An underlying theme within regulation research is the search to identify which regulation strategies or styles may prove better than others. However, this may be misguided in part, as individuals can use different ER strategies to achieve the same goals (Campos, Walle, Dahl, & Main, 2011). Individuals can activate what they consider an appropriate strategy but find that success is not necessarily assured (Gross, 2013). These points highlight the importance of being flexible in ER strategy selection, so replacing an activated strategy can be effective if goals are not being adequately achieved (Bonanno & Burton, 2013; Bonanno, Papa, Lalande, Westphal, & Coifman, 2004). This suggests that being flexible in strategy selection can often be considered as adaptive. This is especially the case in the context of adolescence, where young people often feel a heightened and intense emotional arousal and regulating it effectively becomes imperative (Ciarrochi, Leeson, & Heaven, 2009). Being able to access a wide range of strategies and to employ them flexibly has the potential to help young people successfully navigate the emotional extremes of adolescence (Steinberg, 2014).

The differences in various strategies can be distinguished by the success of the strategy and its personal cost. The personal cost of the strategy may result in different ends, both behaviourally and psychologically (Gross, 2014). For instance, suppression of emotion may decrease behavioural expression, but often exacerbates the inner emotion experience (Gross, 2002; Hayes et al., 2012). Cognitive reappraisal on the other hand, has been reported to be effective at decreasing behavioural expression as well as emotion experience (Gross, 2002). At face value cognitive reappraisal could appear to always be

the most appropriate strategy, compared with suppression. However, the intensity of the emotion may prove a factor which can further determine strategy selection and its related outcomes. For example, cognitive reappraisal has been reported as being a preferred strategy over distraction when the intensity of emotion is low, but when emotion intensity is high, distraction is preferred over cognitive reappraisal (Sheppes, Scheibe, Suri, & Gross, 2011).

Thus, a strategy may be selected as a means of achieving a specific goal, although selection may be dependent also on the emotion experience of the individual. Zeman and colleagues (2006) point out that any given emotion may be regulated in a number of ways. However, the end result is tied to the specific social demands, which will determine whether the strategy itself is adaptive or maladaptive (Compas et al., 2009). This theme of identifying what should be considered adaptive or maladaptive strategies, can be seen throughout the clinical psychology literature, where the labelling of strategies as maladaptive or adaptive is often based on their relationship with a range of self-reported health outcomes (Aldao & Nolen-Hoeksema, 2012). This approach however does not necessarily account for the complexity of the ER process and the significance of its context. As a result, this thesis does not label any strategies in its empirical investigations either as globally adaptive or otherwise. Rather, all conclusions which arise from the empirical findings within this thesis should be interpreted in relation to the adolescent context and will not be generalised across unrelated contexts.

Excessive unsuccessful attempts at selecting a strategy and dealing with a particular situation can be associated with ER failure (Nolen-Hoeksema, 2012). This is often what one would expect in individuals exhibiting some forms of psychopathology. Conversely, a healthy individual often successfully uses a range of regulation strategies across each day (Gross, 1998), while the chronic use of strategies that don’t lend themselves to flexibility is

often associated with psychological tolls over time (Gross, 1998; Hayes et al., 2012). More recently, strategies such as acceptance have been proposed as a way to regulate one's emotions. This involves changing what can be changed but making room for what can't be changed, such as intensity or frequency of difficult emotions (Valdivia-Salas et al., 2010). Acceptance of difficult emotions may therefore negate the difficulties associated with excessive unsuccessful attempts to regulate emotion with other strategies.

Measures which account for a range of strategies and for flexible strategy selection, should prove advantageous when seeking to assess ER strategies and how they are related to a range of psychological outcomes. Broad assessment may help inform interventions and treatment work aimed at reducing the destructive outcomes associated with regulation difficulties (Bloch et al., 2010). This is especially relevant for the developmental stage of adolescence, where opportunities for successful intervention may bring life-long benefits (Steinberg, 2014) and may help ensure that the development of many long-term psychological problems is averted (Bloch et al., 2010; Compas et al., 2014).

**Emotion Regulation Outcomes**

Gross (2014) describes the outcome as being the final core feature of ER. The outcome of ER is described as the combination of the regulation strategy and the goal (Gross, 2014). The psychological outcomes of using specific regulation strategies are what have helped fuel the strong growth in regulation research in recent years (Adrian et al., 2011). Psychological tolls or outcomes can differ, depending on the strategy employed and on the individual's environment (Compas et al., 2009). In the context of this thesis, the outcome is considered how an adolescent's well-being and/or mental health is possibly affected by the use of various regulatory responses. Empirical evidence suggests that poorer regulation ability in adolescents is related to various psychopathologies. It is not necessarily clear however if psychopathology is the outcome of poorer ER, or if ER

difficulties are themselves the outcome of psychopathology (Larsen et al., 2013; McLaughlin et al., 2011).

A range of ER strategies have been connected with both internalizing (Garber, Braafladt, & Weiss, 1995; Silk, Steinberg, & Morris, 2003; Suveg, Hoffman, Zeman, & Thomassin, 2009) and externalizing issues (Eisenberg et al., 2001; Frick & Morris, 2004; Morrongiello, Kane, McArthur, & Bell, 2012). Much of this research however has only focussed on relationships between the strategies of suppression and cognitive reappraisal, and a range of different outcome variables. More recent research is now examining the psychological outcomes when flexible ER strategies such as acceptance and awareness are used in response to distressing emotions (Gratz & Roemer, 2004). Physiological measures in adolescents suggest that acceptance-based regulation strategies can result in positive physiological outcomes (Vasilev, Crowell, Beauchaine, Mead, & Gatzke-Kopp, 2009). This thesis seeks to investigate how the outcomes of well-being and mental health are affected when a range of flexible regulation styles in adolescence are used across time.

This section has covered the three core features of ER as proposed by Gross (2014). It has outlined that ER can be undertaken to achieve specific goals, which may range across social and psychological domains. In pursuit of achieving these goals, a range of ER strategies may be employed. These three core features of ER as proposed by Gross (2014) reflect strong aspects of a regulatory process that is controlled rather than unconscious or automatic. It is the mental health outcomes associated with using different ER strategies which this thesis is primarily interested in: Are specific dimensions of ER more important than others for the healthy development of a young person's mental health? The following chapter introduces the theoretical models of ER that are relevant for this thesis. This will allow the reader to see how the core features of ER as presented in this chapter, fit within the theoretical frameworks which will be used to guide this thesis.

# Chapter 3 Theoretical Models of Emotion Regulation

## 3.1 Introduction

This section introduces the relevant theoretical models used in this thesis to guide its understanding of emotion regulation (ER). It is essential for research efforts that the process of ER be defined and informed by a strong theoretical base (Cole, Martin, & Dennis, 2004; Gross, 1998; Gross, 2014). In doing so, a higher level of refinement may be achieved in relation to issues such as measurement development and the interpretation of findings. The emotion-generation system has been singled out as one of the most viable means of classifying ER strategies (Koole, 2009). As noted previously, the emotion cycle consists of multiple stages (Gross & Thompson, 2007), and core features of ER were introduced and discussed in Chapter 2. This thesis now introduces two key models, that taken together, will mutually inform the understanding of ER used within this thesis. The first model specifically provides clarity about the particular stage of the emotion cycle in which this thesis assesses regulation. The second theoretical model is used to understand the nature of the specific dimensions of ER which will be under measurement in this thesis. The final section concludes with a definition mutually informed by these two theoretical models.

## 3.2 The Process Model

The Process Model (Gross, 1998) is a theoretical framework which specifically accounts for regulatory responding across the various stages of the emotion cycle (Figure 4). It builds on the previously presented Modal Model of Emotion (Figure 3) by outlining where regulation may occur across the emotion generation process. The Process Model therefore allows for a sophisticated understanding of ER and identification of when regulation may be understood to have occurred (Gross, 1998; 2014). This model has

advantages which may serve to inform the measurement and interpretation of ER-focussed research. According to Gross's (1998) Process Model, there are five points at which an individual may regulate their emotions. These include four types of antecedent ER stages: situation selection, situation modification, attentional deployment, and cognitive change (Gross, 1998). The final stage, response modulation, is distinguished from the prior stages in that it occurs after the emotion, as a response. As emotion is not one episodic event, the feedback arrow seen in the Process Model accounts for the dynamic and fluid nature of emotion (Figure 4).

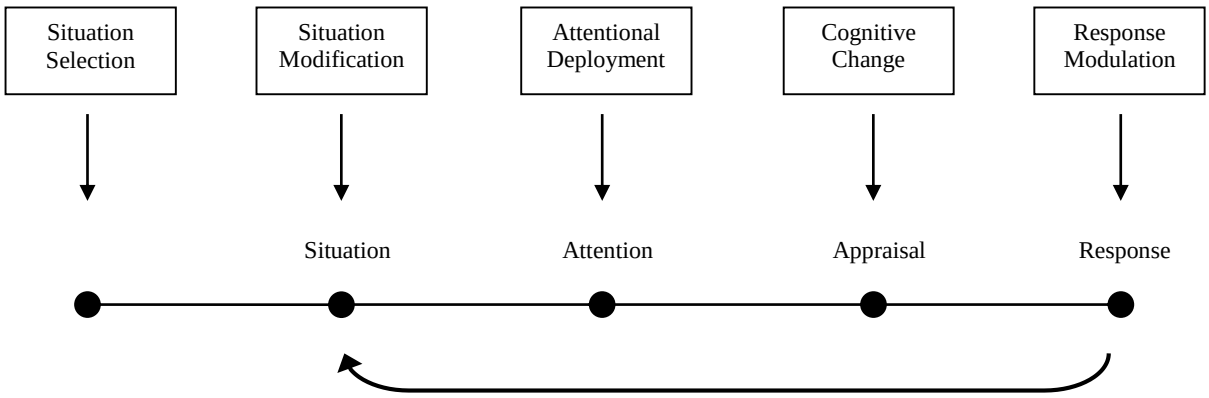


*Figure 4.* The Process Model (Gross, 1998). Permission to reproduce figure granted by Professor James J. Gross (Appendix B).

The situation selection stage is similar to what Campos et al. (2004) describes as niche-picking, in reference to the possibility that an individual can avoid certain people or activities. This stage can be characterised by avoidance in which an individual actively avoids being in a situation which may result in unwanted emotions. Situation modification may see an individual making ongoing changes to their surroundings so as to alter any emotional impact. Gross (1998) gives the example of an individual who may change a planned meeting to simply a phone call, as a means of modifying any unwanted emotion elicitation associated with a face-to-face interaction. Attentional deployment involves focussing on specific aspects of a situation in which one finds oneself. Strategies such as

distraction, which involves the conscious refocussing of attention away from an emotion-eliciting stimulus, is consistent with this stage (Gross, 1998). This behaviour is done with the goal of attempting to reduce or alter the emotion's valence.

The cognitive change stage of the Process Model refers to conscious efforts to reinterpret or create a positive interpretation of a specific situation. Gross (1998) states that strategies such as denial and intellectualization fall under this stage of regulation. Such strategies may be adopted when previous stages of regulation have not adequately reduced the emotion event. Reappraising the situation in another manner may also help the individual from having to deal with the full blown effects associated with the final stage of the emotion generative cycle.

The final stage of the Process Model is the response stage that according to Gross (1998), consists of the modulation of the experienced emotion. This stage involves the individual reacting and responding to the emotion which has been elicited (Gross, 1998). Aside from psychological strategies such as suppression, this stage has also been suggested as being characterised by methods as diverse as drug taking and relaxation techniques, used to lower the physiological responses associated with the felt emotion (Gross, 1998; Gross & Thompson, 2007).

The Process Model (Gross, 1998) presents as a sophisticated and helpful approach to understanding and interpreting the construct of ER. Its major contribution is the identification of distinct stages of ER as either antecedents of or a response to the emotion event. Importantly, the theoretical model holds ramifications for both measurement development and the interpretation of ER-focussed research. This is especially critical when considering the multitude of research findings which have resulted from the affect revolution (Adrian et al., 2011; Tangney & Fischer, 1995). This is because antecedent or response-focussed regulation strategies may differ in effectiveness across the situations and

outcomes being assessed (Gross, 2014). It is therefore critical for research efforts to identify the stage of the emotion cycle that is under measurement. Thus the current thesis focuses specifically on regulation efforts consistent with being a response to a negative emotion. This stage of regulation is targeted specifically, for two primary reasons: Firstly, the majority of ER self-report measures for adolescent populations have been found to focus on this stage of ER (see Chapter 5). Secondly, the response stage of ER is the one most closely identified in the ER literature as being associated with psychopathology (Gross, 2007; Nolen-Hoeksema, 2012). The response stage of regulation, as illustrated by the Process Model, has long been associated with the modulation of an emotion. This thesis seeks to explore this connection further by investigating other means of response-focussed regulation that go beyond just the modulation of an emotion.

As earlier outlined, one of the core features of ER is that of the strategies that an individual may employ across the emotion cycle (Gross, 2014). For successful dissemination of regulation focussed research, it is essential to identify the regulation stage in which the specific dimension of regulation or strategy is being measured. This is because regulation at different stages has potential to result in different psychological outcomes (Gross, 1998). The present section has highlighted the Process Model of ER (Gross, 1998), emphasising that ER can occur at specific stages of the emotion cycle. The following section examines a model and approach to regulation which is congruent with the dimensions or strategies of ER that are specific to this thesis.

## 3.3 The Psychological Flexibility Model

The Process Model (Gross, 1998), it has been established, is a theoretical model which can aid the identification of the stage of the emotion cycle where a range of individual strategies may be employed. This thesis focuses on the regulatory response stage of the emotion cycle. It is therefore essential to be clear on the nature of the

dimension of ER under measure and its underlying function. This thesis now explores a theoretical model and understanding of emotion that does not exclusively endorse modulation as the only regulatory response that can be used when experiencing distressing or upsetting emotions. Rather, the preferred approach is reflective of the rise of acceptance and awareness style responses as effective means of regulating distressing emotions (Gratz & Roemer, 2004; Hayes et al., 2012). These can involve making room for negative emotions by responding flexibly and engaging in goal directed behaviour (Valdivia-Salas et al., 2010).

Support for the effectiveness and acceptance of this approach to ER is building (Kring & Sloan, 2010). Nolen-Hoeksema (2012) points out that a number of related theories now suggest that an individual's inability to regulate negative emotions through effective strategies such as acceptance may result in psychopathology. This is also consistent with Cole et al. (1994), who state that difficulties in regulating emotion can be experienced when emotion regulation loses flexibility and breadth. As previously mentioned, the use of effective strategies is a core feature of ER (Gross, 2014). Depending on the intended goal, drawing on a range of regulation responses (not just those which focus on modulation such as expression suppression) may be necessary before success can be assured (Bonanno & Burton, 2013). The emphasis on responding with regulatory flexibility is therefore essential. The Psychological Flexibility Model (Figure 5) is representative of flexible-based responses consisting of a number of dimensions.

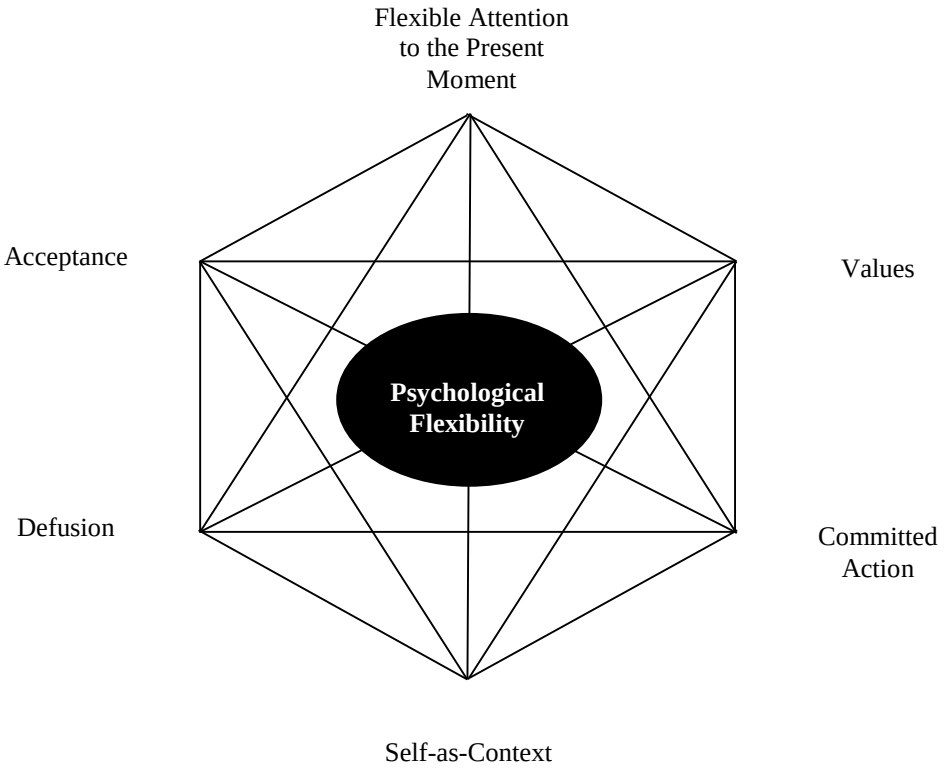


Figure 5. The Psychological Flexibility Model. Permission to reproduce figure granted by Dr Steven Hayes (see Appendix C).

The Psychological Flexibility Model underlies the therapeutic approach of Acceptance and Commitment Therapy (ACT), an approach based on an empirical understanding of verbal behaviour and cognition (Hayes, 2004). The primary contention of ACT is that it is not unwanted thoughts, pain or negative emotions that are the problem. Rather, it is inflexible responses or regulation that result in poorer outcomes to mental health (Hayes et al., 2012; Valdivia-Salas et al., 2010). Valdivia-Salas et al. (2010) point out that humans often have limited control over the onset and nature of their emotions, but do have control as to how they may respond. As a result, the perspective of ACT and its underlying Psychological Flexibility Model emphasises flexible and awareness-based strategies as a response to unpleasant emotions and thoughts (Hayes et al., 2012).

Flexible regulatory responses from this perspective can be undertaken in the face of negative emotions while being mindful of goals and values that are important to the individual. Psychological flexibility as a construct has been found to share many similarities with ER (see Williams, Ciarrochi, & Heaven (2012) for a review; Valdivia-Salas et al., 2010). Although the Psychological Flexibility Model was not posited specifically as a model of ER, it consists of multiple dimensions which can be understood as being consistent with ways of optimising responses to painful thoughts and emotions. These dimensions encourage a shift away from simply using modulation or suppression style strategies as a regulatory response. This can result in a broadening of possible regulatory responses that can ideally become a flexible repertoire of strategies for an individual to draw from.

The Psychological Flexibility Model consists of six key processes which represent flexible and healthy ways of regulating emotion and painful thoughts. These processes are: contact with the present moment, acceptance, defusion, self-as-context, committed action, and values (see Hayes et al., 2012 for a comprehensive review). The processes within the Psychological Flexibility Model that are most closely aligned with the regulatory responses investigated within this thesis, include the following processes: Acceptance is based on accepting negative or distressing thoughts, emotions, or sensations whilst working towards one's own goals (Hayes et al., 2012). This can be done from the context of the present moment, whilst remaining focussed on the goals and values which are important to that particular individual (Coyne, McHugh, & Martinez, 2011). By being able to engage in their experiences more fully, an individual may experience fewer difficulties in pursuing their goals and values (Hayes et al., 2012). Clarity of thought, and not engaging in what is termed cognitive fusion (a struggle with the labels of the words we use) may also help enable goal-focussed behaviour. The Psychological Flexibility Model, in summary

promotes the ability to have emotional clarity and to be more accepting and aware while accessing effective strategies. This behaviour allows one to continue working toward one's goals and values. These dimensions have been identified as useful approaches to regulating our emotions and are distinct from regulatory strategies such as modulation and suppression (Gratz & Roemer, 2004; Hayes et al., 2012).

So far, some complexities associated with understanding and measuring ER have been explored. The Process Model (Gross, 1998) has been introduced as a theoretical framework which highlights that ER may occur at various stages of the emotion cycle. Difficulties regulating emotions perceived as negative have also been identified as being strongly associated with psychopathology (Bloch et al., 2010; Kring & Sloan, 2010). This thesis recognises that being able to respond flexibly to negative emotions is a promising regulatory response (Cole et al., 1994; Hayes et al., 2012; Kring & Sloan, 2010; Nolen-Hoeksema, 2012). Consequently, the empirical component of this thesis seeks to explore how flexible response-based regulation is related to well-being and mental health in adolescents. This entails understanding ER not just as a means of responding to emotion, but by doing so flexibly, in the face of emotion (Ciarrochi & Bailey, 2008; Gratz & Roemer, 2004; Hayes et al., 2012). The Psychological Flexibility Model is an established theoretical model which can be used to understand the benefits of responding to emotion flexibly through acceptance and goal focused behavior. Investigating ER dimensions informed by the Psychological Flexibility Model in adolescents is a novel and promising approach. The following section introduces the definition employed to convey an understanding of ER throughout this thesis.

## 3.4 Defining Emotion Regulation

This thesis focuses on how regulatory responses to negative emotion are related to mental health and well-being in adolescents over time. It aims to investigate aspects of ER

that are congruent with approaches represented in part by ACT and by the Psychological Flexibility Model (Hayes et al., 2012). As discussed earlier, ER is a complex and multi-dimensional process (Cisler & Olatunji, 2012). It is therefore intended to assess ER comprehensively across a number of regulatory dimensions. Gratz and Roemer's (2004) definition of ER acknowledges the multiple dimensions of ER and the benefits of regulatory responses which are reflective of aspects of psychological flexibility. They define emotion regulation as consisting of (a) awareness and the understanding of emotions, (b) acceptance of emotions, (c) the ability to control impulsive behaviours and behave in accordance with desired goals when experiencing negative emotions, and (d) the ability to use situationally appropriate ER strategies flexibly to modulate emotional responses as desired, in order to meet individual goals and situational demands (Gratz & Roemer, 2004).

Gratz and Roemer's (2004) definition of ER is consistent with an approach that emphasises the importance of flexible and goal-focussed regulatory strategies as a means of responding to the presence of difficult feelings. It accentuates the importance of individuals responding with flexibility, acceptance, and awareness of an emotion event. Goal-directed behavior is also considered to be congruent with the values-based responses illustrated within the Psychological Flexibility Model (Figure 5). The importance of goal-directed behavior during times of negative emotion and difficult feelings is also consistent with other popular and related conceptualizations of ER (Gross, 1998; Hayes et al., 2012; Linehan, 1993[a]; Thompson, 1994). By incorporating regulatory dimensions, including acceptance, flexibility, and awareness of emotions it is possible to address the importance that these responses have been observed to hold in mental health (Cole et al., 1994; Hayes et al., 2012; Nolen-Hoeksema, 2012). The definition by Gratz and Roemer (2004) also highlights how regulatory responses can be situational. Gross (2014) has also emphasized

that ER does not occur in isolation and can be effected by social influences. The adolescent social context is a unique one (Steinberg, 2014), and the following chapter will now turn toward considering some salient factors which may support and influence an adolescent's ability to regulate their emotions.

# Chapter 4 Social Factors and Emotion Regulation in Adolescence

## 4.1 Introduction

The previous chapters have investigated the philosophical and theoretical foundations of ER. Through consideration of the Process Model it was established that the regulation of emotions may occur at multiple stages across the emotion cycle (Gross, 1998; Gross, 2014). Past research has gone to extensive effort to emphasise the relationships between individual ER strategies and various measures of psychopathology (Aldao et al., 2010). Within this body of work is the inherent assumption that ER difficulties, can exert direct effects leading to poorer mental health. This is concerning, as there is a lack of longitudinal research to verify the causal nature of this relationship, especially within adolescent populations (Neumann et al., 2011). The empirical component of this thesis, the longitudinal research, seeks to investigate and clarify this relationship. This is not the only issue however which must be addressed by research focussing on the process of ER. The need to understand whether salient factors within an adolescent's environment contribute to, or influence their ability to regulate their emotions, has also been raised in recent times (Fosco & Grych, 2012; Gross, 2013). For example, social proximity and interpersonal interactions have been found to influence the way in which people regulate their emotions (Coan & Maresh, 2014). This suggests that other individuals within our environment have the capacity to influence how we regulate our emotions.

Not recognising, and failing to assess the effect that social factors may have on the process of ER can prove a critical oversight in regulation based research (Fosco & Grych, 2012). Indeed, capturing and accounting for prominent social influences in ER research, has recently been labelled as essential for the field to address in future research (Fosco &

Grych, 2012). This is because, while multiple aspects of family and social functioning have been recognised in theory to be influencing young peoples' ER, historically they have been studied separately (Fosco & Grych, 2012).

Adolescence is a stage of development where individuals become increasingly sensitive to their social environment. As a result, this may influence their emotional and social behaviour (Blakemore & Mills, 2014). Emotion regulation (ER) strategies developed and used in the family context may not translate well into new social contexts that adolescents will experience (Thompson & Goodman, 2010). This may also result in them becoming more susceptible to influences from a range of individuals within their environments (Steinberg, 2014). It has been highlighted that important individuals related to the family and social environment have the potential to impact on an adolescent's ER functioning (Amone-P'Olak et al., 2009). Further influential factors may include conditions such as the single parent family, family transitions, such as divorce or parent remarriage, and low socio-economic urban backgrounds (Barrett & Turner, 2005).

Gratz and Roemer (2004) have stated that "knowledge of the specific emotion regulation strategies used by an individual, in the absence of information on the context in which they are used, may provide little information about the individual's ability to regulate his or her emotions effectively" (p. 42). Identifying those individuals from an adolescent's social context who may teach or support a young person how to regulate their negative emotions is essential. Perhaps the three most important sources of support in an adolescent's life are their parents, friends, and teachers (Steinberg, 2014). Social support is defined as one's perceptions of supportive behaviours from individuals, who may include parents, teachers, and peers, all of whom may help to support psychological functioning, or even to buffer against adverse outcomes (Malecki & Demaray, 2002; Malecki & Demaray, 2006). Indeed, the relationships, and the support an adolescent receives from these

individuals, can potentially have a powerful effect on their emotions. When an individual reaches middle childhood and later adolescence, the history of the parent-child relationship in particular has been found to be critically relevant to an adolescent's own emotion repertoires (Klimes-Dougan & Zeman, 2007).

Gross (2013) has recently suggested that social support (from parents) during adolescence may potentially present as an unwelcome intrusion. This perception of adult intrusion in some adolescents, may also extend to other adults in their lives, such as teachers. Gross (2013) therefore supports the notion that during adolescence, a transition may occur towards close friends as the preferred sources of social support. However, not having the benefits of close friends and the support that they can provide, can result in social and emotional difficulties (Erdley, Nangle, Newman, & Carpenter, 2001) and result in a number of actions, such as reaching out for support from delinquent peers (Barber, 1996). The relationship and social support from peers during adolescence should be considered as critical. Adolescents aged 13 to 17 years have reported that peer evaluation affects their perception of their own social and personal worth (O'Brien & Bierman, 1988). Adrian et al. (2009) point out the importance of friendship for healthy ER and suggest that friendship is associated with less severe psychological symptoms; less severe symptoms in turn are associated with better ER.

Nonetheless, the notion that adults become redundant as sources of support or influence throughout the teen years may prove overstated. Sterrett, Jones, McKee, and Kincaid (2011), in an extensive integrative review, found that perceived support from non-parental adults was related to positive behavioural, social, and emotional outcomes in adolescents. Non-parental involvement in the form of social support may, therefore, not necessarily be perceived as an intrusion by young people. The benefits may further depend on the role that these adults play in young peoples' lives, or their method of influence.

Whether or not their importance is ranked lower in importance than close friends can only be tested through extensive comparisons over time. Social support has been hypothesised as being both directly and indirectly related to ER and psychological health (Larsen et al., 2012; Marroquín, 2011). As part of an extensive investigation of the role that ER plays in adolescence, this thesis investigates whether social support from a variety of sources may impact on an adolescent's ability to regulate their emotions effectively and seeks to distinguish whether close friends or adult support are of more importance to an adolescent's ability to regulate their emotions.

This section has highlighted that ER is susceptible to social influences which are external to the individual (Gross, 2013). Emotion regulation (ER) does not occur in isolation, and yet historically, these social factors have been studied separately by past research (Fosco & Grych, 2012). In relation to an adolescent's emotional competencies and regulation, three important sources of social support have been identified: an adolescent's peers, parents, and teachers (Steinberg, 2014). The research in this thesis comprehensively assesses the effects that social support from parents, friends, and teachers may have on an adolescent's ability to regulate their emotions during distressing times. Adolescence has long been identified as a stage where the perceived importance of social support could transition from parents to close friends and peers (Gross, 2013). The following sections explore the proposed relationships and theoretical understandings of ER and social support: Firstly, whether social support has a direct effect on an adolescent's ER, and secondly, whether ER may mediate a relationship between social support and mental health.

## 4.2 Social Support and Emotion Regulation

Adolescence is typified by heightened and intensified emotions being experienced more frequently than at other developmental stages (Ciarrochi et al., 2009; Gilbert, 2012;

Keyes, 2006; Steinberg, 2014). This is due to the rapid neurological, psychological, and social changes associated with maturation across adolescence (Ciarrochi et al., 2009; Steinberg, 2014). In navigating the many challenges associated with this tumultuous stage, the ability to successfully regulate emotions should be viewed as essential. Interactions with social support providers within the adolescent context may serve both to model and to support strategies of healthy regulation in adolescents (Marroquín, 2011). The failure of previous ER research to take into account individuals who provide social support has been highlighted (Lourel, Hartmann, Closon, Mouda, & Petric-Tatu, 2013; Marroquín, 2011), despite evidence that social support providers are important individuals who can help a young person navigate the heightened emotion experiences which are often associated with adolescence (Malecki & Elliot, 1999; Nolten, 1994). Such individuals may include parents, teachers, and peers (Malecki & Elliott, 1999; Steinberg, 2014).

For adolescents, having a broader social context can contribute to more sophisticated ER. Relationships with others present emotional demands, models, and incentives which can all help to support and grow ER (Thompson & Goodman, 2010). For adolescents the opportunity to disclose emotional experiences with the hope of gaining support from their peers is often experienced throughout the teen years. There is also the opportunity of offering support for others and building friendship bonds and networks (Steinberg, 2014).

The maturation process throughout adolescence ideally consists of a broadening of emotional competencies which includes ER (Riediger & Klipker, 2014). This progression should ideally contribute to transitioning through adolescence and into healthy functioning young adults (Larsen, 2011). Social support has long been acknowledged as a valuable psychological resource for young people (Lourel et al., 2013). A direct effects model of social support has long been thought to directly predict beneficial effects on mental health

(Demaray & Malecki, 2002; Lourel et al., 2013). What is not clear however is whether social support from parents, teachers, and close friends can also directly support an adolescent's ability to regulate their negative emotions during times of distress. Drawing on social contact and support has been labelled a baseline strategy for ER (Coan & Maresh, 2014); a matter of critical importance that is recognised by this thesis. Given that ER has been identified as central to many of the psychological illnesses experienced throughout adolescence (Riediger & Klipker, 2014), any finding that social support may influence or support an adolescent's ER functioning will contribute to a broadening of the research focus beyond considering ER as occurring only in isolation.

Theoretical models and contemporary understandings of ER suggest that extrinsic or interpersonal influences may act to influence an individual's regulation ability (Gross, 2014; Kring & Sloan, 2010; Lewis et al., 2008). How this occurs has been further theorised by Coan and Maresh (2014), who have proposed Social Baseline Theory (SBT), which proposes that interpersonal dependency is necessary for healthy emotional functioning (Hughes, Crowell, Uyeji, & Coan, 2012). Similarly, to the long-held stress buffering hypothesis, SBT suggests that social relationships can provide support and regulate emotions (Coan & Maresh, 2014; Cohen & Wills, 1985;). Ultimately, SBT serves to highlight the importance of social relationships, especially from those sources of support that are in close proximity to individuals. Indeed, much of the correlational research suggests that ER may both influence and be influenced by social interactions and social relationships (Bell & Calkins, 2000). This suggests the possibility not only of a direct effect relationship between social support and ER, but the possibility of a bidirectional relationship as well.

The feasibility of perceived social support directly resulting in an improved ability to regulate negative emotions, also seems to hold good face validity. Social support from

peers for example, may help to down-regulate the effect of negative emotions throughout the education process. An example of this could occur in the well-documented stress-inducing period of exam times: An adolescent may feel prolonged apprehension and fear at the thought of completing an upcoming exam. As a result, their friends, parents, or teachers may provide reassurance, by reminding them that the exam outcome holds no major implications for their final grade. As a result, the young person regulates their emotions directly in response to the received support and reassurance. Indeed, similar examples can feasibly occur across a number of situations within an adolescent's life (Gross, 2014).

For the purposes of this thesis, the first of the proposed relationships that social support may share with ER is referred to as the Direct Effects Model of Social Support (Figure 6). The Direct Effects Model proposed in this thesis suggests that social support will have a positive effect on an individual's ability to regulate their negative emotions as well as mental health. Figure 6 depicts a simplified illustration of the proposed Direct Effects Model associated with social support and ER.

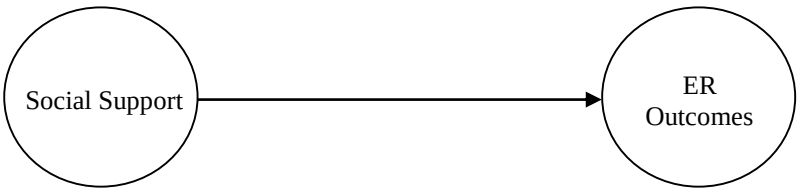


*Figure 6.* Direct Effects Model of Social Support on ER

It is the intention of this thesis to assess empirically whether social support providers, within an adolescent's environment, can directly influence an adolescent's ability to regulate their emotions during times of distress. Social support from a variety of sources has long been acknowledged to be vitally important for young peoples' mental health (Lakey & Cohen, 2000). Social support's potential to affect an adolescent's ER however has not attracted the same attention (Lourel et al., 2013). Difficulties in regulating

emotions over time are often proposed within the ER literature as being related to psychopathology (Nolen-Hoeksema, 2012). Consequently, investigating whether social support has the capacity to directly improve an adolescent's ability to regulate their difficult emotions may have many important implications. This longitudinal research undertaken in this thesis presents as an excellent opportunity to examine whether perceived social support directly influences an adolescent's ability to regulate their negative emotions.

## 4.3 Could Emotion Regulation Mediate Social Support and Mental Health?

The previous section presented the compelling view that social support may directly be related to an adolescent's ability to regulate their emotions. It expanded on the long-established Direct Effects Model of Social Support in proposing that higher perceived social support may result in improved ER in adolescents. This model is tested in the second empirical component of this thesis. A recent and influential integrative review has proposed an alternative model to the Direct Effects Model in which it is argued that ER may be an ideal mediator between both social support and mental health. Marroquín's (2011) review article focussed on the interpersonal influences of social support and how the process of ER could mediate their relationship with mental health. The mediation model as proposed by Marroquín (2011) stands as an alternative to understanding the function of social support as depicted by the Direct Effects Model.

While substantial evidence suggests social support as having a clear association with mental health (ie. the Direct Effects Model), the actual mechanisms remain unclear (Lourel et al., 2013). Testing for mediation therefore, presents as an essential task. Marroquín (2011) points to an increasing range of empirical and theoretical justifications for the proposition that ER can indeed be influenced by interpersonal factors within an

individual's environment. This is consistent with and relevant to the sources of influence and support (e.g. parent, teacher, peers) that have been previously discussed in this thesis. Marroquín's (2011) proposed model can be viewed as an alternative to the Direct Effects Model, or an extension to its hypothesis about the action of social support (Figure 7)

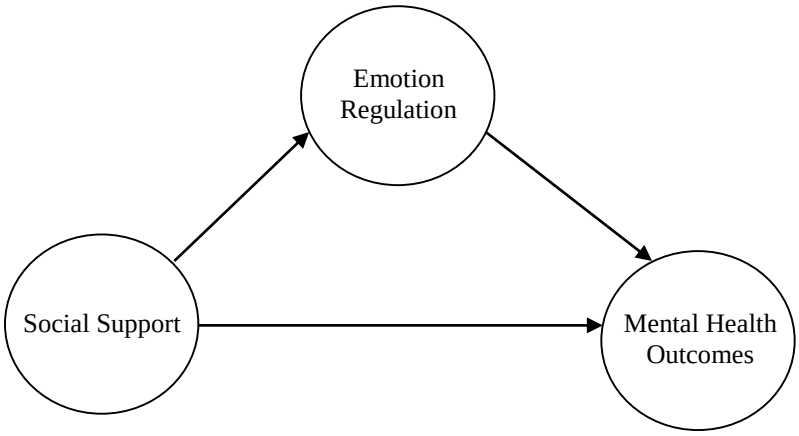


*Figure 7.* Mediation Model with ER as Mediator

The proposed model of interaction by Marroquín (2011) illustrates how ER could mediate the relationship between social support and mental health outcomes. The mediation model suggests that social support from important individuals may help an individual regulate their emotions better, resulting in a positive impact on their mental health. The testing of this model in this thesis will address recent calls for the inclusion of social factors into ER research (Aldao, 2013; Fosco & Grych, 2012; Gross, 2014). This thesis tests whether ER presents as a mechanism which links social support and adolescent mental health or whether, conversely, in line with the Direct Effects Model, social support exerts unique effects on adolescent ER functioning and/or mental health. If social support leads to the development of better regulation, and if better regulation, in turn, leads to improved mental health in adolescents, this will have both theoretical and therapeutic significance and will also support the assertion that ER does not occur solely in isolation; that social factors can play an important role (Gross, 2014). It would also suggest that,

rather than solely targeting ER difficulties in therapeutic approaches, working in conjunction with those who provide social support to adolescents could also prove beneficial for mental health outcomes in young people. For this reason, assessing perceived social support from parents, teachers, and close friends will allow for essential comparisons of importance to be made.

# Chapter 5: Systematic Review Paper for Publication

## Chapter Transition Statement

The introductory chapters of this thesis have explored the development of ER research and the varied contemporary understandings of the process of ER. Emotion regulation (ER) is a broad and highly popular construct within clinical psychology and psychological researcher communities (Gross, 2014). Investigating regulatory responses to negative emotions that emphasise acceptance, goal-focussed behaviour, and flexible use of strategies have all previously been noted as supporting better mental health outcomes in adult populations (Cole et al., 1994; Hayes et al., 2012; Nolen-Hoeksema, 2012). Investigating if similar relationships are present in adolescent populations over time, and the magnitude of these relationships, is a major goal of this thesis.

The theoretical perspectives and understandings of ER are important not only for how we understand, but also how we measure the process of ER. The Process Model outlines how ER occurs at various stages throughout the emotion cycle (Gross, 1998). Clarifying the stages of regulation under measure, and the nature of the emotion being regulated, is essential, to reduce construct ambiguity and misrepresentations of research findings. This thesis focuses solely on an adolescent's regulatory responses to negative emotions. This is primarily because negative emotions are understood to be the most strongly related to psychopathology (Kring & Sloan, 2010).

The initial goal for this thesis in the following paper intended for publication was the selection of an appropriate self-report measure that is consistent with the understanding of ER presented in the introductory chapters of this thesis. This self-report measure was then deployed to assess ER in both Empirical Studies 1 and 2. Empirical Study 1's explicit aim is to test whether ER predicts change in mental health, if mental health predicts change

in ER, or if ER and mental health are reciprocally related. Empirical Study 2 aims to investigate the role that social support plays in the emotion regulatory process. Fosco and Grych (2012), note that historically, social influences which may influence ER have been studied separately. As a result, it was essential for the aims and objectives of both empirical studies that they were aided by the selection and use of a comprehensive and appropriate ER measure. Up to this point, in the introductory chapters, historical, philosophical, and contemporary understandings of ER have been discussed. The following systematic review now gives consideration as to how ER strategies are to be measured.

The systematic review encompasses an examination of all the self-report measurement methods that are currently available. This can be expected to be challenging, as a paucity of measurement tools for assessing ER in the adolescent years has recently been noted (MacDermott, Gullone, Allen, King, & Tonge, 2010). Previously, Phillips and Power (2007) have summarised some of the existing self-report measures that have been used in adolescent populations. Nonetheless, a comprehensive and active comparison between instruments explicitly labelled as ER measures, and validated for use in adolescent populations, has not yet been undertaken. Furthermore, all of the empirical studies in which the identified measures have been used are investigated and extensively summarised. The outcome of this process will serve as a benchmark as well as informing the methodological designs of the empirical studies that follow in this thesis.

The systematic review paper that follows, focuses on the available self-report measures of ER and their use in adolescent populations. The primary goals of the review is to distinguish between the available measures and assess their suitability for use in the two empirical studies. Investigating how these measures have been employed in previous empirical studies will provide an up to date resource that summarises the strengths and weaknesses of the research designs of the existing empirical research. Two main outcomes,

aside from the selection of a measure, arise from this systematic review. The first is the thorough assessment and comparison of measures specifically labelled as ER measures. As noted, this has only been undertaken on a small scale before, by Phillips and Power (2007). Self-report measures of related constructs such as mood and affect regulation are not included in this study, so as to further reduce the ambiguities associated with the ER construct. The second intended outcome is thesis-specific, and provides a solid foundation for the empirical studies to follow in this thesis. It will undertake a summary of all the empirical studies which have utilised these self-reports previously. This will determine if the research question, of whether difficulties regulating emotion is a factor, in either the development, maintenance, or reoccurrence of mental health in adolescence, has been appropriately addressed by the previous empirical research.

# Assessing Emotion Regulation: A Systematic Review of Self-Report Measures for use in Adolescent Populations

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## Statement of Contribution

I acknowledge that my contribution to the following paper as the lead author is 85%. Dr Louise Hayes, Dr Philip Parker, and Professor Joseph Ciarrochi's contributions are weighted as 5% each.

**Abstract**

A deeper understanding of emotion regulation (ER) in young people can help increase our knowledge of the development of adolescent psychopathology (Southam-Gerow & Kendall, 2000). Therefore, the availability of suitable measures designed to assess ER in adolescence is essential for future research efforts. A systematic review of the current ER self-report measures and their use in empirical research was undertaken, examining their strengths and limitations. This revealed a number of shortcomings in the available measures and their use in the empirical literature which focussed on adolescent populations. On this basis a number of suggestions to improve future ER research are made. These suggestions have potential to contribute to innovation in ER-based research and its expansion into assessing larger repertoires of regulatory strategies.

*Keywords:* emotion regulation, adolescents, self-report measures.

## Assessing Emotion Regulation: A Systematic Review of Self-Report Measures for use in Adolescent Populations

Investigation of psychological functioning and emotion regulation (ER) strategies has created an explosion in research, termed the affect revolution (Fischer & Tangney, 1995; Zeman et al., 2006). The use of some emotion regulation strategies, such as rumination and suppression, has been associated with poorer psychological functioning in young people (McLaughlin, Hatzenbuehler, Mennin, & Nolen-Hoeksema, 2011). With the ever-growing empirical evidence linking ER to adolescent functioning, it has become essential to identify appropriate measures which can assess the multi-faceted construct of ER (Koole, 2009; Tamir, 2011). Rather than just engage in a review focussing solely on psychological outcomes related to the use of ER strategies, this review also meets a gap in the literature by systematically identifying, reviewing, and subsequently evaluating, the appropriateness of current ER measures for use in adolescent research. The nature of how each measure can contribute to regulation based research is also examined, together with an investigation into how these measures have been applied in the research designs of previous empirical research.

Emotion regulation (ER) typically is measured in four ways: self-report questionnaires, other informant questionnaires (teacher/parent), observations, and physiological-biological indicators (Adrian et al., 2011). This review focuses solely on self-report measures, for the following reasons: Self-report questionnaires meet the operational demands of large longitudinal studies utilising adolescent participants. The use of multi-year longitudinal designs has the methodological advantage of allowing for inferences of causality to be made. The findings derived from large-scale longitudinal studies have potential to improve dissemination efforts by identifying the dimensions of regulation that should be targeted for intervention. Finally, as adolescence is a time

associated with the acquisition of cognitive, social, and emotional skills, it is thought that adolescents are capable of the necessary emotional reflection required for a self-report questionnaire (Cole, Michel, & Teti, 1994; Phillips & Power, 2007), and therefore it is imperative that we have well-validated and easy to use self-report measures for longitudinal research (Adrian et al., 2011).

**Definitional Issues**

At a basic level, emotions are part of a primitive biological response generated within individuals as a response to a stimulus (Ekman, 2007). In broad terms, how one prepares for and responds to one's emotions forms the basis of what we can understand as ER. The study of emotion and its regulation, which informs much of developmental psychology today, can be traced back to scholars from the times of ancient Greece (see Cicchetti, Ackerman, & Izard, 1995 for a review). Conceptual debate on what constitutes ER and how it should be measured has fuelled much discussion within psychology. While the concept of ER is considered useful theoretically, the scope of its processes and mechanisms is rather vast (Garnefski & Spinhoven, 2001). This is understood to include facial, vocal, and behavioural expressions, as well as cognitive motivations (Adrian et al., 2011). Increased enthusiasm for the study of ER, coupled with the broad nature of regulation, has led to what is often considered as an ill-defined construct (Cole et al., 2004).

As a unifying definition of ER has yet to be reached, the task of clarifying an operational definition becomes imperative if the field of regulation is to grow from a foundation of consensus (Bloch et al., 2010). Numerous definitions of ER have been produced; these may mutually inform or alternatively lead to confusion in the interpretation of the construct (Calkins, 2010). Most recently, Bloch et al. (2010) called for consensus on a definition of ER. Bloch et al. (2010) argues for Gross and Thompson's

(2007) definition: that emotion regulation can be the automatic or controlled, conscious or unconscious process of individuals influencing emotions in self, others, or both. Two excellent suggestions for ER researchers (Bloch et al., 2010; Cole et al., 2004) are either to unify the field around an agreed approach or to explicitly state the definition and understanding of ER which underlies any research efforts. We believe that explicitly stating the definition of ER that each researcher may choose to adopt is a preferable method and will serve to promote clarity.

The complexities associated with understanding ER are further highlighted when considering the influential Process Model of ER (Gross, 1998). The Process Model serves to illustrate that the process of regulation can occur at various stages of the emotion cycle. An understanding of the Process Model is helpful, since it suggests that regulation is a process, and that this process may occur at distinct stages, which should be reflected in its measurement.

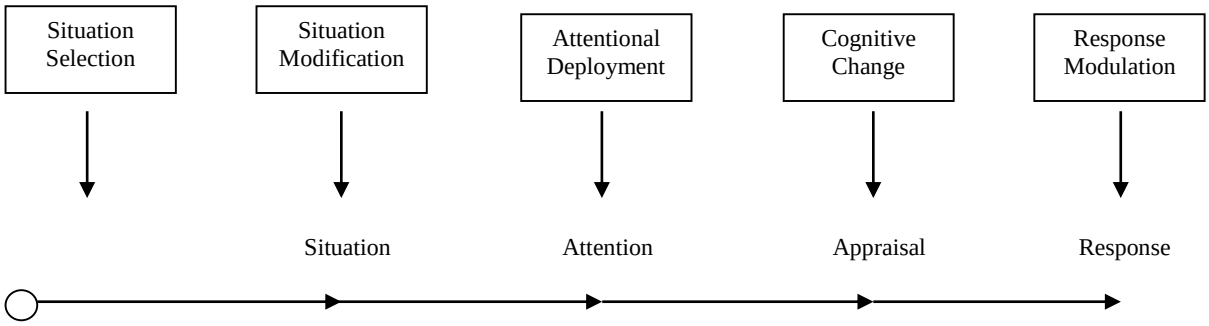


*Figure 8.* The Process Model of Emotion Regulation

According to Gross' Process Model (1998), there are five points at which an individual may regulate during the emotion experience (Figure 8). These include four antecedent stages of regulation: situation selection, situation modification, attentional deployment, and cognitive change (Gross, 1998). Antecedent strategies are often considered to be more effective than response-focussed regulation strategies (Aldao, 2013). The final strategy, response modulation, is distinguished from the prior stages in that it

occurs as a response to the emotion. It is the response stage of the ER process when faced with negative emotions that is often most closely related to psychopathology (Bloch et al., 2010).

The Process Model is a useful approach to understanding and interpreting the construct of regulation. It affords the ability to identify regulation strategies as being either antecedents of or responses to a specific emotion event. This is important when examining and comparing findings drawn from regulation focussed research, as particular strategies employed at various stages may prove more effective (Gross, 2014). It also serves as a caution for regulation researchers not to just report findings broadly (e.g. 'Difficulties regulating emotion') but rather should encourage researchers to specify the particular stage of emotion that is being regulated, and with which regulation strategy. In summary, we would expect the self-report measures reviewed by our systematic review process to be interpretable according to the different stages in which ER may occur, as outlined in the Process Model (1998).

This review then, had two clear objectives which were pursued in two separate sections. The first was to identify and then critically examine the self-report instruments used to measure ER in adolescents (Section 1). The second was to examine and assess their use in empirical research (Section 2). The culmination of these two objectives is expected to help guide the choice of ER self-report measures within research designs that will help further our knowledge of the process of ER across the developmental period of adolescence.

## Review Method

The search strategy for adolescent self-report ER measures was undertaken by entering the following key words: adolescent, emotion, regulation, strategies, and emotion regulation measures, and their truncated versions, into the relevant academic databases. To

be included in the research associated with Objective 1 of the review, ER self-report measures needed to be recorded as being valid for use in ages 12 to 18 years. To be included in the empirical review (Objective 2), studies needed to have undergone a peer-review process, to have been published, to have been used in publications a minimum of two times (e.g., an initial validation study and a first empirical study), and to be available in a full-text version in English. Selected studies must have used a ER self-report measure or would be excluded. Once each measure was identified, primary empirical references for those measures were sourced (see Figure 9).

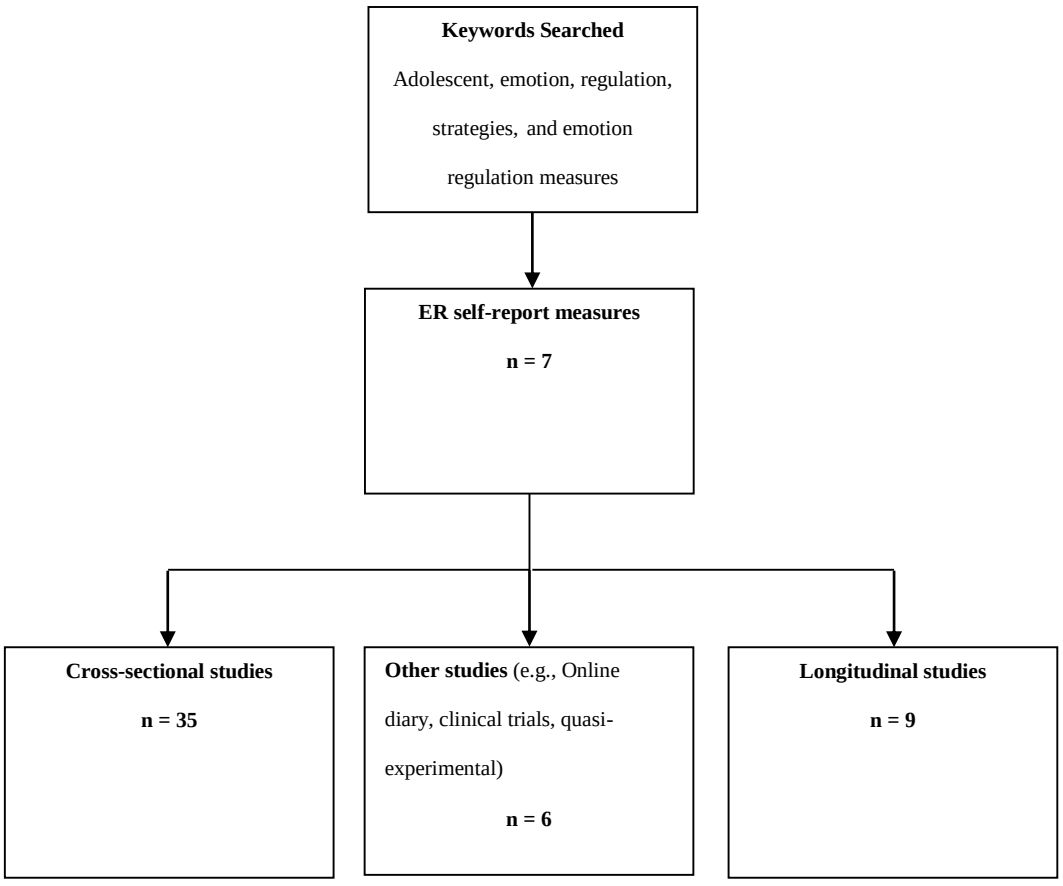


*Figure 9.* Search process for ER self-report measures

Each primary reference was then entered into the Web of Science which includes seven citation databases including: Science Citation Index Expanded (SCI-EXPANDED) --1900-present, Social Sciences Citation Index (SSCI) --1900-present, Arts & Humanities

Citation Index (A&HCI) --1975-present, Conference Proceedings Citation Index- Science (CPCI-S) --1990-present, Conference Proceedings Citation Index- Social Science & Humanities (CPCI-SSH) --1990-present, Book Citation Index– Science (BKCI-S) --2005-present, and Book Citation Index– Social Sciences & Humanities (BKCI-SSH) --2005-present. These databases are updated weekly and allows for the searching of cited references through 8,500 journals, encompassing 230 disciplines.

The search process resulted in 58 studies being identified. Of these 58 studies, 8 were excluded during screening from the final process, as they included measurement methods of regulation that did not satisfy the review's inclusion criteria (e.g., they relied on parent ratings, experience sampling methods, or were classed as non-emotion regulation measures). In the remaining 50 studies, seven self-report measures were identified as being utilised (see Table 1). Following this, empirical studies in which each of the included ER measures had been used were collected and collated for comparison (Table 2 Appendix M). These categories of comparison included a range of characteristics: sample, age-range, methodological design and popularity ranking, based on recorded usage.

**Section 1: Identified Self-Report Emotion Regulation Measures**

As noted above, the initial phase of the search process revealed seven self-report ER measures utilised in empirical research that met this systematic review study's inclusion criteria (listed in Table 1). Full versions of each of these measures were requested from first and second authors. If measures were not forthcoming, items were then extracted from the primary confirmation/validation study. The full versions of each of the available measures may be viewed in the Appendices section of this thesis (see Appendices D-L). The number of regulation strategies or dimensions of ER assessed in each of the measures ranged from two (Emotion Regulation Questionnaire Child-Adolescent version, ERQ-CA; Gross & John, 2003) to nine (Cognitive Emotion

Regulation Questionnaire, CERQ; Garnefski, Kraaij, & Spinhoven, 2001). Measures were also found to have been used in a range of adolescent samples, from school-based adolescents through to those admitted for psychiatric care.

**Measure Summaries and Characteristics**

The Emotion Regulation Questionnaire (ERQ) is a measure originally designed for use in adult samples (Phillips & Power, 2007). It has been used in adolescent populations, both in its original format and in the revised ERQ-CA (children and adolescents) version (Gullone & Taffe, 2012). Regardless of version, the ERQ claims to be strongly representative of two distinct stages of Gross' Process Model (Gross, 1998; Gullone & Taffe, 2012). This allows comparisons to be made between strategies considered to be antecedent (reappraisal) and those considered to be a response (suppression). Items are worded specifically to measure one of these two factors: reappraisal or suppression. Gresham and Gullone (2012) reported good internal consistency in a large sample of adolescents for the cognitive reappraisal scale of .82-.86 and .69-.79 for expression suppression. The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) in contrast, focuses solely on regulation as a response to negative emotions. Items commence with 'When I'm upset.....', making it clear that regulation is being assessed as a response to a negative emotion. The DERS (Gratz & Roemer, 2004), like the ERQ, was originally designed for use in adults. The results of our review demonstrate that it has also been successfully employed in adolescent samples, where it has achieved acceptable reliability and validity with alpha's across the six subscales of the DERS ranging between .76 to .89. (Weinberg & Klonsky, 2009). Examination of the usage of the DERS in the empirical literature records it as being amongst the most popular measures (Table 1). The six ER dimensions within the DERS are reflective of the rise of acceptance and awareness style approaches to regulation (Gratz & Roemer, 2004; Hayes et al., 2012). Rather than

being a modulation based response, the DERS seeks to assess responses to negative emotion which are indicative of making room for the negative emotion and carrying on behaviourally. The DERS has been recognised as a comprehensive measure with the potential to improve existing ER research (Perez, Venta, Garnaat, & Sharp, 2012). It is also a measure which shares similarities with that of the dimensions within the Psychological Flexibility Model.

Table 1.

*Self-Report Emotion Regulation Measures Utilised in Adolescents*

| Measure Name | Strategies under Measure* | Items | Age range measure has been used in (years) | Number of studies using Measure |
|---|---|---|---|---|
| **Difficulties in Emotion Regulation Scale** (DERS) Gratz & Roemer (2004) | NonAcceptance<br>Awareness<br>Clarity<br>Goals<br>Strategies<br>Impulse | 36 items | 11-17 years | 12 |
| **Cognitive Emotion Regulation Questionnaire** (CERQ) Garnefski, Kraaij, & Spinhoven (2001) | Self Blame<br>Other Blame<br>Rumination<br>Catastrophizing<br>Putting into Perspective<br>Positive Refocussing<br>Positive Reappraisal<br>Acceptance<br>Refocus on Planning | 36 items | 12-16 years | 13 |
| **The Emotion Regulation Questionnaire for *children and adolescents*** (ERQ-CA); Gross & John (2003) | Cognitive Reappraisal<br>Expressive Suppression | 10 items | 12-19 years | 9 |
| **The Regulation of Emotions Questionnaire** (REQ) Phillips & Power (2007) | Internal Functional<br>Internal Dysfunctional<br>External Functional<br>External dysfunctional | 32 items | 11-20 years | 2 |
| **The Emotion Regulation Index for Children and adolescents** (ERICA); Macdermott, Gullone, Allen, King, & Tonge, (2010) | Emotional Control<br>Emotional Self-awareness<br>Situational Responsiveness | 16 items | 9-15 years | 2 |
| **Emotion Expression Scale for Children** (EESC); Penza-Clyve & Zeman (2002) | Lack of Emotional Awareness<br>Lack of Motivation to express negative emotion | 16 items | 7-17 years | 14 |
| **The Children's Sadness Management Scale** (CSMS) **& Children's Anger Management Scale (CAMS)**; Zeman, Shipman, & Penza-Clyve (2001) | Assesses both adaptive and maladaptive aspects of emotion expression and regulation for the specific emotions of sadness and anger | **Sadness** 12 items **Anger** 11 items | 7-17 years | 11 |

*Refer to Supplementary Material B for full definitions of the individual strategies presented in Table 1

The Cognitive Emotion Regulation Questionnaire (CERQ; Garnefski, Kraaij, & Spinhoven, 2001) assesses a larger range of strategies than does the DERS (Gratz & Roemer, 2004), and ranks as one of the most popularly used measures in the empirical research to date (see Table 1). The CERQ assesses nine cognitive regulation strategies. Cognitive coping strategies are defined here as the means of managing the intake of emotionally arousing information that involve thoughts or cognitions that help to manage or regulate our emotions (see also Thompson, 1991). In general, the CERQ can be used in two different ways: (1) to measure someone's cognitive coping style across different types of life events (what adolescents generally/usually think after the experience of negative or unpleasant events), and (2) to measure someone's cognitive coping strategies associated with a specific life event (what adolescents actually think in response to a particular negative event; Kraaij et al., 2003). In adult samples internal consistency for the CERQ have been reported as being good (Garnefski et al., 2001). A study using an adolescent sample by Amone-POlak et al. (2007) has revealed many of the subscales alphas to be <.60, although sample issues such as size and comprehension may have contributed to this. While it does not assess behavioural style regulation strategies, the CERQ presents as a comprehensive measure of cognitive based strategies.

One of the more recently developed measures is the Regulation of Emotion Questionnaire (REQ; Phillips & Power, 2007), that takes a functionalist view of emotion. This measure was designed on the basis of the assumption that some strategies used to regulate emotions can be adaptive and/or functional, or alternatively maladaptive and/or dysfunctional, and that strategies can be drawn on internally or externally (Phillips & Power, 2007). It assesses four forms of ER: internal-dysfunctional, internal-functional, external-dysfunctional and external-functional. These factors are representative of how the regulation process is susceptible and how it is influenced both by external and internal

processes (Phillips & Power, 2007). The REQ scales with the exception of external-functional subscale have all been found to be >.70. This measure is explicitly aimed at assessing the frequency with which maladaptive and dysfunctional ER strategies are used.

The Emotion Regulation Index for Children and Adolescents (ERICA; MacDermott et al., 2012) measures the regulation factors labelled Emotional Control, Emotional Self-Awareness, and Situational Responsiveness. Like the REQ (Phillips & Power, 2007) it was developed only recently, and was validated in an adolescent population reporting internal consistency of .81. Examination of ERICA (MacDermott et al., 2012) reveals multiple items that ask the respondent to make a judgement of themselves, rather than to engage in a clearly regulatory response. Examples of this include "I am a sad person" and "I enjoy seeing others hurt or upset." It is clear that items such as these share commonalities with affect and behavioural style measures. While claiming to be a regulation measure, many of the items are not reflective of the process of regulation, as highlighted earlier by Gross and Thompson (2007), and Gratz and Roemer (2004). Further examination of ERICA items also reveals that they cannot be allocated to belonging to a specific stage of regulation as outlined by the Process Model. The ERICA (MacDermott et al., 2012) would appear to represent much of the ambiguity surrounding the ER construct. Its adoption and use over time in its current form as a self-report regulation measure would seem to be inappropriate with better options available.

Two further measures which, unlike those previously mentioned, were originally designed for children, are the Emotion Expression Scale for Children (EESC; Penza-Clyve & Zeman, 2002) and the Children Emotion Management Scales (CEMS: Zeman, Shipman, & Penza-Clyve, 2001) which consist of the Children's Sadness Management Scale (CSMS) and the Children's Anger Management Scale (CAMS). The Children's Emotion Management Scale–Coping factor (CEMS; Zeman et al., 2001) examines children's ability

to manage negative emotions (i.e., sadness and anger) through constructive management of emotional arousal and display (e.g., "I try to calmly deal with what is making me sad", "I can stop myself from losing my temper"). Laible et al. (2010) found adequate internal consistency of .70 for the CSMS with an adolescent sample. Each of these measures can be viewed as examples of assessing strategies which may be used to regulate emotion in the face of anger or sadness. Unlike the earlier ERICA (MacDermott et al., 2012), they are clearly consistent with the process of ER. Finally, another measure, also originally intended for children, but that showed up in this systematic review as having been used in adolescent populations, is the Emotion Expression Scale for Children (EESC; Penza-Clyve & Zeman, 2002). This 16-item questionnaire assesses two aspects of deficient emotional expression: lack of emotional awareness, and lack of motivation to express negative emotion. Hatzenbuehler et al. (2008) reported high internal consistency for the EESC of .88. This measure was recorded as the most popular of the seven ER measures, being used a total of 14 times in adolescent populations.

Recent views have suggested that research on adolescent ER is hindered by a lack of appropriate age validated measures, plus weak theoretical integration of measures and theory (Adrian et al., 2011; Gullone & Taffe, 2012). In the present review seven age-validated measures have been identified, and their individual approaches to ER measurement and popularity have been presented. Examination of how these measures have been utilised in the empirical literature is undertaken in section 2. Information regarding the statistical design, population characteristics, and findings of individual studies can be observed in Table 2 (see Appendix M). The next section expands on some of the most salient aspects presented in that Table 2 (see Appendix M).

## Section 2: Key Characteristics of Empirical Studies

It is widely accepted that the ability to disseminate research findings with confidence must be reinforced with a combination of robust effects and longitudinal findings establishing temporal ordering between constructs. Empirical studies were therefore firstly assessed on the basis of research design. Of the 50 identified studies, the overwhelming majority utilised a cross-sectional design (mean sample size $n$ = 383). Nine studies incorporated a longitudinal design (mean sample size $n$ = 1098). Of these, three studies were 3-time point longitudinal designs, with each wave spanning one year. A major drawback of these limited longitudinal studies is that they can be observed as suffering from unrealised potential. An example of this is a study by Vasilev et al. (2009), who validated the DERS with a physiological measure, but only administered the DERS in the third year of the study, making comparisons with previous years impossible. The remaining two longitudinal studies, which undertook 3-time point designs, enjoyed the strengths of large samples, but unfortunately Larsen et al. (2012) and Gullone et al. (2010) both used the ERQ-CA, with the former using only the suppression subscale. The ERQ-CA, while is strongly reflective of two distinct stages of Gross' Process Model, is not a comprehensive measure with multiple subscales; by using only one of its subscales this limits its potential breadth even further.

The dominance of the cross-sectional design as observed by this review process is most likely reflective of the prohibitive costs and degree of planning associated with undertaking longitudinal research. While cross-sectional studies are limited by their ability to measure change, many of the assessed studies further limited themselves through not measuring ER with a comprehensive measure. The use of single measures proved a prominent theme across the empirical literature. Thirty-five of the 50 studies in total chose to use only one self-report measure to assess ER. This suggests that regulation research

could potentially be under sampling the broad range of possible strategies used on a daily basis by adolescents, which would, therefore, make meaningful comparisons between a range of strategies impossible. The importance of examining multiple strategies and regulation repertoires which may work in conjunction with each other has been raised recently (Aldao, 2013; Bonanno & Burton, 2013).

Aside from the paucity of longitudinal designs and the dominance of single measures used within the cross-sectional studies, some other mixed approaches that utilised self-reports were also observed. The relationship between ER and headaches was investigated in an online diary format (Massey et al., 2011), a case study (Allen et al., 2012), a quasi-experimental/intervention/post treatment approach (Hammond et al., 2009; Suveg et al., 2009), and in the incorporation of a structural diagnostic interview (Trosper & Ehrenreich-May, 2011). These are recent studies and indicate an acceptance of incorporating ER self-report measures with other measurement methods, into a range of alternative research designs.

## Discussion

At the end of the review process, three primary themes were noted as emerging. Firstly, the majority of self-report measures were not specifically designed and intended for use in adolescent populations. They are not developmentally specific; rather, they were found to be adapted from either child or adult samples. This is contrary to the mounting evidence that emotional development is a unique and critical focus in adolescence (Steinberg, 2014). We now have multiple studies showing that adolescent brain development is uniquely focussed on emotions (e.g. Dahl, 2004; Steinberg, 2010), and yet we use measures that are not designed specifically with adolescents in mind. It should be considered imperative that if developmental stage specific measures are not developed and utilised, research findings should be interpreted in the context of the unique period of

adolescent brain development. The second emerging theme relates to the reliance on cross-sectional designs. Further limiting the usefulness of some of these studies is the decision to use either single or partial self-report measures. This is concerning, as Gross' Process Model (Gross & Thompson, 2007) outlines multiple stages in which multiple regulation strategies may be employed. By limiting the scope of these existing measures to only one subscale, we further reduce the ability to account for the true breadth of the regulation process in the period of adolescence.

The third theme noted in the review process was the limited availability of self-report measures that assess antecedent strategies. The majority of the identified measures focus heavily on regulation as a response to an emotion or event, rather than as an antecedent to it. In this case, the emotion is generally considered a negative event. Examples of responses to negative emotions (DERS; Gratz & Roemer, 2004), sadness and anger (CSMS & CAMS; Zeman et al., 2001), responses to unpleasant events (CERQ; Garnefski et al., 2001), and motivation to express negative emotion (EESC; Penza-Clyde & Zeman, 2002) were all observed. The Process Model informs us that ER, in broad terms, may be measured both as an antecedent to emotion and as a response (Gross, 1998). Nonetheless, as found by this systematic review process the existing measures are heavily weighted toward assessing regulatory responses.

The clear exception is the reappraisal subscale from the ERQ-CA (Gross & John, 2003), and possibly some items contained within the REQ (Phillips & Power, 2007). Understanding if benefits from undertaking antecedent based regulation exist for adolescent mental health could prove important at both a theoretical and a clinical level. Measuring ER prior to the elicitation of emotion however is generally considered quite difficult, and different to assessing a response (Eisenberg, Champion, & Ma, 2004). The popularity of the ERQ-CA (Gross & John, 2003), and the consideration of its reappraisal

scale as a measure of an antecedent strategy may prove a potential danger when interpreting regulation research. The CERQ (Garnefski et al., 2001) for example, measures a number of similarly labelled strategies (e.g., positive reappraisal, putting into perspective, and positive refocussing) but examination of these scales reveals them to be assessing regulation firmly as a response rather than as an antecedent-based strategy prior to an event or emotion. The challenge for the development of future self-report measures is to create more measures that assess ER at the antecedent level. This is because cognitive reappraisal that the ERQ-CA (Gross & John, 2003) currently uses to assess antecedent-based regulation, represents only one antecedent strategy of the many that an adolescent may possibly use on a daily basis.

**Future Research**

The fourth theme recognised by this review is applicable to all future ER research. Emotions can be considered context specific, and different circumstances in life can require flexible regulation with strategies drawn from a repertoire of strategies, rather than a rigid one-strategy-fits-all approach (Lougheed & Hollenstein, 2012); none more so than with adolescents. Understanding the complexities of how a range of strategies may be used and interact, must be a focus for future research. For instance, Aldao (2013) points out that much of what we know from ER empirical studies is from the comparison of strategies to a limited number of other strategies. This is consistent with our review findings, with strategies such as reappraisal being compared solely to suppression (ERQ-CA, Gross & John, 2003). Therefore, future research must sample a range of ER responses, across situations.

Combining existing measures could potentially facilitate the use of statistical analyses such as Latent Profile Analysis (LPA), which allows for the examination of the flexible use of strategies across contexts and times. Gullone et al. (2010) and Adrian et al.

(2011) argue for combining measures. For example, Gullone endorses the use of the ERQ-CA (Gross & John, 2003) with a battery of other ER measures. Bonanno and Burton (2013) urge the need for future experimental studies which utilize a greater number of regulation measures in experimental designs. It would seem that selecting existing comprehensive measures which assess multiple strategies (e.g., DERS & CERQ), rather than combining multiple measures with fewer strategies, may also prove a viable alternative that addresses this issue.

Finally, ER is considered interdependent, and these social factors that may often influence the process of ER have been largely ignored (Fosco & Grych, 2012). Most empirical studies appear to be focussed solely on exploring relationships between ER strategies and some form of psychological functioning (e.g., anxiety, well-being). This is important, as it seems from the limited longitudinal research that the true relationship between various ER strategies and mental health has not yet been established in adolescents. Nonetheless, as ER is a construct attracting much attention, it seems an oversight that factors (particularly socialization factors) that may influence ER have not been investigated in conjunction. Seeking out the social sources and influences which may lead to healthy ER, rather than focussing squarely on the consequences of strategy use, should be addressed by future research. As ER has also been theorised and connected with other important adolescent factors, including friendships and social interaction, a broadening of scope in the research literature has also been suggested as being both informative and refreshing (Kiuru, Aunola, Nurmi, Leskinen, & Salmela-Aro, 2008; Lopes et al., 2011; Wentzel, Barry, & Caldwell, 2004).

**Limitations**

Emotion regulation presents as a popular yet difficult construct to adequately measure. This is largely due to conceptual overlap, misuse of related measures, and the

paucity of comprehensive measures available for use. We are confident that we have identified the majority (if not all) of the available self-report ER measures for adolescents which met the stated criteria introduced at the commencement of the review process. There still remains the possibility that empirical studies which have utilised some of the identified measures have been overlooked during the database search. This could be the case in particular with studies which have used measures and published in non-English journals. Nonetheless, despite this possible limitation, this systematic review represents the most comprehensive investigation to date of adolescent ER self-report measures and the empirical studies that they have been used in.

**Self-Report Measures Moving Forward**

Mindfulness and acceptance-based strategies as responses to dealing with distressing or negative emotion have grown in popularity within the field of psychology and its research literature (Gross, 2014; Hayes et al., 2012). This trend was reflected in our popularity rankings, with measures consisting of these strategies proving amongst the most popular (e.g., DERS and CERQ). Other than focussing on modulation as a response to emotion, broader responses and a greater emphasis is now starting to be placed on focussing on one's relationships with emotions or feelings (Hayes et al., 2012). The measurement of these strategies in the identified measures may occur under different circumstances however. Inclusion of these acceptance and flexible style strategies, while clearly stipulating at what stage in the emotion cycle, and what type of emotion they are assessing, has the potential to inform future ER research. Perez and colleagues (2012) believe that the DERS (Gratz & Roemer, 2012) in particular will help improve ER research, as it presents as a comprehensive multi-scale measure assessing several dimensions of ER. The DERS (Gratz & Roemer, 2012) is also representative of acceptance style responses to negative emotions and the importance of being able to select appropriate

strategies. Indeed, this review has shown the DERS (Gratz & Roemer, 2012) to have been successfully employed in adolescent populations, and its further use in longitudinal designs should subsequently be encouraged.

Many of the measures in the current review started their life as adult- or child-targeted measures. They have been modified in some cases (e.g., ERQ-ERQ-CA; Gross & John, 2003), but have all demonstrated acceptable utility by being employed in adolescent samples. Furthermore, many of these existing self-report measures have been employed in various samples, ranging in size and type. While samples have been diverse in age, the review process has clearly revealed previous research designs have been limited in scope. Subsequently, the review's findings confirm that undertaking longitudinal designs should be viewed as the immediate goal for regulation researchers who focus on the developmental period of adolescence.

**Final Thoughts**

Clarity and consensus surrounding the ER construct is needed. We believe that the stages of the Process Model (Gross & Thompson, 2007) present as a sound basis for comparison and interpretation of individual regulation strategies. The examined self-report ER measures reviewed are reflective of the differing stages, conceptualisations, and goals of measuring ER. It has been revealed that many of the strategies under measurement can differ as to their cognitive or behavioural ends. Cole, Martin, and Dennis (2004) stipulate that researchers should explicitly state their working hypothesis of ER. We would add to this that from a measurement perspective, researchers should also identify and explicitly state the stage in the emotion cycle at which ER strategies are being assessed. Clarifying this will help with future interpretation and comparison of findings between studies.

# Chapter 6: Empirical Study 1 For Publication

## Chapter Transition Statement

The systematic review process identified the self-report ER measures that are currently available and investigated how they had been previously used in adolescent populations. There were two driving forces necessitating this review. The first is that ER research with adolescents had been reported as being hindered by a lack of appropriate age validated measures, and weak theoretical integration with theory (Adrian et al., 2011; Gullone & Taffe, 2012). Prior to undertaking the systematic review, previous reviews focussing on ER self-report measures for use in adolescent populations have not been extensive (Phillips & Power, 2007). The review's scope also extended to an investigation and summary of how each of the self-report measures has been utilised in the empirical literature. This served to highlight the paucity of longitudinal studies that have sought to establish the nature of the relationship between ER and mental health in adolescents across time.

The second impetus for the review came from the need to select a comprehensive ER measure for use in this thesis. As a result, this thesis will now employ the DERS (Gratz & Roemer, 2012) in its two planned empirical studies which will now follow. In summary the systematic review process has assisted with furnishing essential input into the design of the empirical research components of this thesis. It also provides a beneficial and valuable reference which can be utilised by other researchers in the field, particularly for those who may choose to investigate the understudied process of ER and its relationship with mental health in adolescent populations.

One of the primary empirical aims of this thesis is to examine the relationship between various dimensions of ER, and well-being and mental health. The empirical literature collated within the systematic review broadly suggests that difficulties in regulating emotions are connected to greater psychological difficulties in adolescence (see Table 2 Appendix M). Which dimensions of ER, and which specific strategies are the most helpful or detrimental to a young person's mental health, is however not clear. Indeed, it has been reported that some ER strategies can be more strongly related than others to psychopathology (Aldao et al., 2010). The popular use of some measures which assess these strategies, may also be helping to inflate their perceived importance. The existing longitudinal research does not allow for firm conclusions to be made regarding the direction and magnitude of this relationship (Larsen et al., 2012; Larsen et al., 2013; McLaughlin et al., 2011).

One of the glaring outcomes revealed by the systematic review process is that the longitudinal studies identified were only found to be assessing a limited number of ER strategies (eg., 1-2). This was largely the result of using partial versions of measures, or measures which consist of only two ER strategies. As noted, daily regulation may involve a range of strategies which can be successfully applied, or not (Aldao, 2013). The assessment of a limited number of ER strategies does therefore not model the full spectrum of potential strategies that an individual may employ throughout their day. This is a particularly important consideration for the developmental stage of adolescence, because individuals are learning even more strategies and building their regulation repertoires over this time (Steinberg, 2014). The incorporation of comprehensive self-report measures into studies with longitudinal designs should be considered a necessity, to adequately understand the construct of ER and the role it plays in adolescence. This will also allow

powerful statistical analysis to be employed to determine if ER is an antecedent or consequence of poorer mental health and affective states.

As a direct result a comprehensive multi-strategy measure of ER has been employed in the following empirical studies contained within this current thesis. This measure is also reflective of the dimensions of the Psychological Flexibility Model, which has been shown to be related to psychological benefits of the human condition (Hayes et al., 2012). It is also a theoretical model comparable with contemporary understandings of ER that acknowledge the use of acceptance and awareness of the emotion experience as useful regulatory responses (Valdivia-Salas, Sheppard, & Forsyth, 2010). The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) has been noted for its comprehensive nature and for its potential to improve ER research (Perez, Venta, Garnaat, & Sharp, 2012). The dimensions of ER that it assesses focus on flexibility, acceptance, and goal focussed behaviour. The DERS (Gratz & Roemer, 2004) also has good theoretical integration, and clearly measures regulation as a response to negative emotions, which are known to be strongly associated with psychopathology (Kring & Sloan, 2010). The utilisation of the DERS (Gratz & Roemer, 2004) in the following empirical components of this thesis, also marks the first time it has been used with an adolescent population longitudinally.

The review chapter has highlighted the methodological shortcomings of previous empirical research. The reliance on cross-sectional designs has not provided sufficient insight into the true relationship of ER and mental health. It is still not clear if ER results in poorer mental health, whether poorer mental health results in difficulties regulating emotion, or whether these factors are reciprocally related. Empirical Study 1 seeks to test the direction and magnitude of this relationship in a longitudinal design that spans 12-months. This will serve to clarify the nature of the relationship between ER and mental

health in young people. In turn, this will represent a significant empirical contribution to the field of adolescent ER research. As highlighted in the review chapter, longitudinal research using adolescent populations which utilise comprehensive measures is rare; such research is however necessary if the field is to progress.

# Emotion Regulation and Adolescent Mental Health and Well-being: A Longitudinal Investigation

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## Statement of Contribution

I acknowledge that my contribution to the following paper as the lead author is 80%. Dr Louise Hayes, Dr Philip Parker, Professor Patrick Heaven and Professor Joseph Ciarrochi's contributions are weighted as 5% each.

**Abstract**

This empirical paper examines how multiple dimensions of emotion regulation (ER) are related to mental health and well-being in adolescents. Despite substantial research on ER in adults, little research, in comparison, has examined how ER is related to mental health in adolescents over time. We collected ratings of ER and well-being longitudinally, from adolescents in Grade 8 and again in Grade 9 ($N$ = 2,070; males = 1,019 females = 1,051). Structural equation modelling was used to test whether ER predicted change in well-being, whether well-being predicted change in ER, or whether they were reciprocally related. The analyses broadly support a reciprocal influence model. Further analysis reveals that the ability to engage in goal directed behaviour when upset was the most reliable antecedent to positive change in well-being and mental health.

*Keywords*: emotion regulation, adolescence, longitudinal, well-being

## Emotion Regulation and Adolescent Mental Health and Well-being: A Longitudinal Investigation

The behaviour that we engage in when we feel emotions, which is here termed emotion regulation (ER), has profound effects on our well-being (Bloch, Moran, & Kring, 2010). This is particularly important in adolescence, where new experiences that allow for growth (Steinberg, 2014) are constantly emerging, and where difficulties in regulating emotion have been linked to the development and continuation of psychopathology (Bradley, 2000; McLaughlin, Hatzenbuehler, Mennin, & Nolen-Hoeksema, 2011). Adolescence is characterised by heightened emotional arousal and rapid psychological and physical development (Ciarrochi, Leeson, & Heaven, 2009; Gilbert, 2012; Keyes, 2006). Although many children transition to adolescence and then to adulthood without difficulty (Parker, Lüdtke, Trautwein, & Roberts, 2012; Steinberg & Morris, 2001), a concerning number find that the developmental journey from childhood into adolescence coincides with a rise in psychological difficulties (Costello, Copeland, & Angold, 2011).

Approximately 15% of adolescents have been found to suffer from a mental disorder at some stage of adolescence (Fleming, 2007; Kieling et al., 2011; Roberts, Attkisson, & Rosenblatt, 1998; Sawyer et al., 2001). If left untreated, psychological difficulties in adolescence may lead to behavioural problems in adulthood, which can prove costly both in treatment and in lost productivity (Chiles, Lambert, & Hatch, 1999; Fleming, 2007; Mathers, Vos, & Stevenson, 1999; McGue & Iacono, 2005). Emotion regulation (ER) however may allow for the capacity to manage distressing emotions more effectively. Recent longitudinal research has shown that difficulties in regulating emotion are antecedent to psychopathology in adolescents (McLaughlin et al., 2011). Conversely, further longitudinal research by Larson and colleagues (2012; 2013) has demonstrated

strong support for the ER strategy of ‘expressive suppression’ following on as a consequence of depressive symptoms. The temporal ordering of ER with regard to various aspects of mental health in adolescents is not clear. The crucial focus of this study is to utilise longitudinal data to establish the extent to which ER strategies act as an antecedent to mental health and well-being (antecedent model), as a consequence of mental health and/or difficulties with well-being (consequence model), or both (reciprocal model).

The study of ER has taken centre stage in the field of developmental psychology (Eisenberg, Champion, & Ma, 2004; Tangney & Fischer, 1995). It would appear that there is both theoretical and increasingly, empirical justification for the proposition that specific ER strategies are associated with adolescent psychological well-being. While unsuccessful efforts to regulate emotion are thought to play a significant role in the etiology and maintenance of adult psychopathology, research confirming this in adolescents is limited, and is mostly cross-sectional in design (Neumann, van Lier, Frijns, Meeus, & Koot, 2011).

A range of ER strategies have been connected with both internalizing (Garber, Braafladt, & Weiss, 1995; Silk, Steinberg, & Morris, 2003; Suveg, Hoffman, Zeman, & Thomassin, 2009) and externalizing issues (Eisenberg et al., 2001; Frick & Morris, 2004; Hessler & Katz, 2010; Morrongiello, Kane, McArthur, & Bell, 2012). Much of this research has focussed on regulation strategies such as expressive suppression and cognitive reappraisal, which are aimed at down-regulating and modifying emotional responses respectively. For example, an adolescent who is bullied at school might suppress their emotion by saying: “Even though I’m angry, I’m not going to show it”. Conversely, they might reappraise the situation: “Even though I may get angry, I know this isn’t the worst thing in the world”. There is also preliminary evidence to suggest that some regulatory strategies, such as self-blame and rumination, may play a larger role in internalizing issues in adolescence than does externalizing (Garnefski, Kraaij, & van Etten, 2005).

The current study aims to address the dearth of empirical attention to ER strategies that emphasise one's behaviour in the face of experiencing difficult emotions, rather than one's attempt to simply down-regulate them (Adrian, Zeman, & Veits, 2011). Such strategies include emotional awareness, acceptance, and committed action in the presence of upsetting emotions, and are frequently the target of mindfulness-based therapies, such as Acceptance and Commitment Therapy (ACT; Hayes et al., 2012), mindfulness-based stress reduction (Kabat-Zinn, 1990), and mindfulness-based cognitive therapy for depression (Ma, & Teasdale, 2004). This form of ER places an emphasis on flexible regulatory responses which allows one to engage in positive behaviour such as working towards one's goals (Valdivia-Salas, Sheppard, & Forsyth, 2010).

The paucity of longitudinal research on ER in adolescents has resulted in the relationship between ER and mental health not being clearly established. It is often assumed that ER strategies like non-acceptance are the antecedents and causes of poor mental health (Hayes et al., 2012), but it is also possible that they are a consequence of poor mental health. For example, when adolescents are going through a difficult emotional time—often related to exposure to new experiences, such as sexual attraction, broadening peer groups and independence—they may find it more difficult to accept their difficult emotions (Hayes & Ciarrochi, 2015). That is, poorer well-being and mental health may be a cause of lower acceptance of upsetting emotions. We would expect that regulation processes that are antecedent or reciprocally related to mental health and well-being are the most likely candidates for intervention, in contrast to those processes that appear to be only a consequence or reflection of well-being.

**Definition and Theoretical Basis of Emotion Regulation**

Emotion regulation (ER) is considered a multidimensional construct, and has varied definitions and interpretations (Cisler & Olatunji, 2012). This has resulted in the often

confusing use of an all-encompassing term, emotion regulation, which may be interpreted as covering a variety of strategies, competencies, and approaches to dealing with emotion. In the past, the most prominent definition came from Thompson (1994), who stated that ER is "the extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions, especially their intensive and temporal features, to accomplish one's goals" (p. 28). Today, ER is seen to also include the awareness, understanding, and acceptance of emotions, and the ability to act in a desired way regardless of one's emotional state (Gratz & Roemer, 2004).

A useful theoretical model which further assists in understanding when individual regulation strategies may be utilised, in relation to the emotion cycle, is the Process Model (Gross & Thompson, 2007). The Process Model accounts for regulatory responding, that may occur at various stages of the emotion cycle. This allows for a more sophisticated understanding of emotion, and serves to distinguish between the times when regulation processes may be employed. According to Gross (1998), there are five points at which an individual may regulate during the emotion experience. These include four stages of antecedent ER strategies: situation selection, situation modification, attentional deployment, and cognitive change (Gross, 1998). The final stage, response modulation, is distinguished from the prior stages in that it occurs as a response to the emotion.

Negative emotions are those thought to be most often associated with psychopathology (Kring & Sloan, 2010). The current study focuses on the response stage of regulation as proposed in Gross' Process Model. Some approaches suggest that all response-style strategies are used for the purpose of down-regulating or modulating negative emotions (Gross 1998; see Nolen-Hoeksema, 2012 for a review). In this study we make no such assumption, but rather assume that acceptance and awareness-based regulation may be done solely for the purpose of pursuing valued goals, rather than simply

reducing negative feelings. This assumption is consistent with the psychological flexibility model, which encourages regulatory responses which make room for the difficult emotion whilst still working towards one's goals. This approach leads to measures such as the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004), that focus on flexible dimensions of regulation that are assessed as responses to an upsetting emotion. No studies to date have sought to investigate these dimensions of ER longitudinally in adolescents and how they are related to well-being and mental health.

**Emotion Regulation and Mental Health in Adolescence**

Emotion Regulation (ER) research in adolescence has been identified as being understudied, in comparison to child and adult populations (Adrian, Zeman, & Veits, 2011; Neumann, van Lier, Gratz, & Koot, 2010). Furthermore, there have been calls for increased research that focusses on ER in middle childhood and adolescence (Klimes-Dougan & Zeman, 2007). What the research that has been undertaken thus far suggests is that regulating negative emotions effectively is likely to be beneficial to an adolescent's mental health (see empirical studies Table 2 Appendix M). Recently, a switch in focus to a different style of ER response has revealed that being aware of one's emotions, and effectively identifying them, can hold positive benefits for adolescents. This approach emphasises the initial noticing of negative emotions, in contrast to simply modulating them (Hayes & Ciarrochi, 2015). The effectiveness of responding to negative emotions with regulation strategies that promote acceptance, awareness, and goal directed behaviour is in contrast from those strategies whose sole focus is to suppress negative emotions (Hayes et al., 2012).

The DERS (Gratz & Roemer, 2004) is a comprehensive measure consisting of ER dimensions which are representative of flexible regulatory responses to upsetting emotions. Cross-sectional research utilizing the DERS has revealed that a lack of emotional clarity,

non-acceptance, and limited access to ER strategies are related to higher anxiety and depression (Neumann et al., 2010). To the author's knowledge, longitudinal research involving the DERS and adolescent populations has not been undertaken, so antecedent, reciprocal and consequential conclusions cannot be drawn. Related research however has revealed awareness of emotional states as being associated with both anxiety and depression in older children (Suveg, Hoffman, Zeman, & Thomassin, 2009). Furthermore, McLaughlin et al. (2011) found they could predict psychopathology seven months later in adolescents, by using a latent unitary variable of emotion dysregulation (that included emotional understanding). Further evidence suggests that both acceptance and mindfulness of emotions are also related to more positive emotional states in adolescents (Harnett & Dawe, 2012). Adolescents who experienced poorer clarity of their emotions and had difficulty identifying them, have also been found to suffer decreased positive affect and poorer social support one year later (Ciarrochi, Heaven, & Supavadeeprasit, 2008). Related strategies—including acting with awareness, emotional awareness, and experiential acceptance—have also been found to significantly predict well-being in adolescents (Ciarrochi, Kashdan, Leeson, Heaven, & Jordon, 2011). In summary, flexibly focussed ER responses would appear to be related to aspects of psychological health in adolescents.

**Adolescent Well-being and Emotion Regulation**

Well-being is understood to be a broad construct, conceptualised and measured in a variety of ways (Tomyn & Cummins, 2011). Broadly speaking, successful emotion regulation is thought to be associated with improved levels of well-being (Gross, 1998; Thompson & Calkins, 1996). Distinguishing well-being from mental illness, Keyes (2002; 2005) has proposed that many individuals, otherwise free of mental disorder, neither feel healthy nor function optimally. As a result, they may be considered as having low well-

being, or to be languishing. This has resulted in a differentiating between mental illness and well-being, in which the latter represents something positive.

The current study utilises a broad measure of mental health, accompanied by a measure designed to assess social, psychological, and emotional domains of well-being. Individuals considered to be flourishing as opposed to languishing in social, psychological, and emotional domains have the best chance of experiencing high levels of well-being. Flourishing has also been linked in undergraduates to higher self-control and academic grades (Howell, 2009), and reported as being most prevalent in adolescents aged 12-14 years (Keyes, 2006), with age related declines occurring as adolescence progresses (Tomyn & Cummins, 2011). In summary, emotion competency has been found to be crucial to many domains of psychological functioning. Previous research has not investigated causal relationships between Keyes' definition of well-being and dimensions of emotion regulation in adolescence. As revealed earlier, most studies involving ER focus mainly on its relationship with measures considered reflective of psychopathology. This study will investigate causal, antecedent, and consequential relationships between ER and well-being and mental health.

**Sex Differences**

Sex differences in emotional competency and understanding have been found in child (Bajgar, Ciarrochi, Lane, & Deane, 2005) and adolescent populations (Ciarrochi, Chan, & Baygar, 2001). The possibility that emotion regulation (ER) may be responsible for sex differences in psychopathology in adolescence has been raised (Garber et al., 1995; Hampel & Petermann., 2006; Neumann et al., 2010). There have been very few longitudinal studies which have considered testing for sex differences in ER and psychopathology (Sweeting & West, 2003). Nonetheless, some research at a cross-

sectional level suggests the possibility of sex differences in ER within adolescent populations.

Two studies which have utilised the DERS with an adolescent cohort at a cross-sectional level, have found that girls had significantly greater ER difficulties, although the results were not consistent across studies (Neumann et al., 2010; Weinberg & Klonsky, 2009). Numerous studies have shown that adolescent girls report significantly higher anxiety and depression than do boys (Allgood-Merton, Lewinsohn, & Hops 1990; Bender, Reinholdt, Esbjørn, & Pons, 2012). It is also suggested that girls experience higher emotional distress in adolescence (Hampel & Petermann, 2006). Efforts to connect the process of ER with psychological outcomes in adolescents however have not been widely undertaken. Previous research has confirmed mean differences in ER between the sexes, but it remains unknown whether individual sex differences in ER may share a relationship with well-being and mental health over time. This study will investigate whether sex differences in ER are present and, if so, whether they share a significant relationship with both well-being and mental health.

**Rationale and Hypotheses**

We assume that difficulties with response-focussed ER is related to both lower well-being and to decreased mental health in adolescents. This study sought to evaluate the extent to which ER strategies acted as distinct antecedents to adolescent mental health and well-being over a one-year period. To date, the literature is mixed as to the true direction of this relationship. We therefore aim to test antecedent, consequent, and reciprocal influence models to establish temporal ordering. It was hypothesised that those adolescents with poorer response-focussed ER would report lower well-being and decreased mental health. The current study sought to establish which singular dimension of ER would be the best and most unique predictor of any improvements in mental health and well-being. Finally, it

undertakes an exploratory investigation of sex differences in ER to examine if any observed differences share a relationship with adolescent mental health and well-being.

## Method

### Participants

Participants were students from 17 Australian secondary schools that participate annually in the Australian Character Study (ACS), a large longitudinal study designed to assess adolescent psychological well-being and development. Informed consent was gained prior to the commencement of the study (see Appendix N). Participation was voluntary and without any financial incentive. Participant data were recorded at two time points. Wave 1 (*N* = 2,070; male = 1,019, female = 1051) were students from Grade 8 (Mean age = 13.72, *SD* = .44). Wave 2 (*N* = 1842; male = 1084, female = 758) comprised of students from Grade 9 (Mean age = 14.64, *SD* = .44). The percentage of youth aged between 10 and 14 years at Wave 1 was 74.2%. At Wave 2 the percentage of youth aged between 10 and 14.9 years was 73.8%. Background information was also gathered on each of the adolescents. Parents' marital status was reported as 74% married, 8% separated and 11.8% divorced; 6.3% reported their marital status as other. Father's reported occupation status at Wave 1 was assessed as 1.2% pensioner/homemaker, 22.6% professional, 15.9% trades, 16.4% labourer, transport, production-related, 4.8% community service, 4.8% sales clerical and 8.4% not reported. Reported occupations for mothers at Wave 1 were 9.4% pensioner/homemaker, 22.4% professional, 4.3% trades, 4.5% labourer, transport, production-related, 9.3% community service, 17.1% sales clerical; 7.8% of occupations were reported as other.

Selection of participants was done at the level of school: thus, attrition was small and was largely due to adolescents moving schools, or to absenteeism on the day of testing. Nevertheless, selectivity effects were assessed by calculating Cohens *d* for key measures

between those who participated in both waves of the study and those who did not. Differences between completers and non-completers were small for all analysis variables: mental health ($d$ = .14), subjective well-being ($d$ = .05), and all the individual ER strategies ($d$ = 0.01 to .06) of the DERS. No major disparities in gender between completers and non-completers were observed for any of the well-being and mental health variables across the two time points.

**Measures**

***Difficulties in Emotion Regulation Scale (DERS)***

The DERS (Gratz & Roemer, 2004) is a widely used 36-item self-report instrument designed to assess difficulties in regulating emotion (see Appendix D). The six subscales within the DERS are designed to measure an individual's flexible use of situationally appropriate dimensions of regulation in the face of distressing emotions (Gratz & Roemer, 2004). The DERS has been found to correlate strongly in adolescence with experiential avoidance, depression, anxiety, suicidal ideation, alcohol, and drug use (Weinberg & Klonsky, 2009). The six clinically relevant DERS subscales consist of (a) Lack of awareness of emotional responses, (e.g., When I'm upset I pay attention to how I feel), (b) Lack of clarity of emotional responses, (e.g., When I'm upset I am confused about how I feel), (c) Non-acceptance of negative emotional responses, (e.g., When I'm upset, I feel like I am weak), (d) Limited access to ER strategies perceived as effective, or a passive, inflexible response to emotions (e.g., When I'm upset, my emotions feel overwhelming), (e) Difficulties controlling impulses when experiencing negative emotions, (e.g., When I'm upset, I have difficulty controlling my behaviours), and (f) Difficulties engaging in goal directed behaviour when experiencing negative emotions (e.g., When I'm upset, I have difficulty getting work done). The DERS has been previously validated within an adolescent sample aged 11-17 years (Neumann et al., 2010). The alpha of the six scales in

the current study ranged across the two time points from .86 to .88 for Strategies, .85 to .86 for Non-acceptance, .88 to .88 for Impulse, .65 to .69 for Clarity, .83 to .85 for Goals, and .81 to .83 for Awareness. Items on the questionnaire used in the current study were coded and calculated so that higher scores indicate greater difficulties in regulating emotion.

***Subjective Well-being***

The measure of subjective well-being used consisted of 12 items taken from the Child Development Supplement that assess emotional, psychological, and social well-being (CDS-II; Keyes 2002, 2005). The three emotional well-being items ask each participants to indicate how much in the past month they have felt: happy, interested in life, or satisfied? The following subscale of psychological well-being consists of four items. An example is in the past month "How often did you feel confident to think or express your own ideas and opinions"? The final subscale of social well-being consists of five items and contains the example, in the past month "How often did you feel that our society is becoming a better place"? All 12 items for the Child Development Supplement are scored on a six point Likert scale ranging from 1 = *Never* to 6 = *Everyday*. Cronbach's alphas for the three subjective well-being scales for the first wave of data ranged from .80 to .85. The Cronbach's alphas for the second wave of data ranged from .84 to .90. Higher scores indicated that an individual was flourishing within that specific domain of well-being, whereas lower scores indicated languishing.

***Mental Health***

The General Health Questionnaire (GHQ-12; see Appendix P) is a measure of current mental health (Goldberg & Williams, 1988). An example item is "Have you recently been losing confidence in yourself"? The GHQ-12 is scored along a Likert scale ranging from 1 to 4. The GHQ-12 has been validated with adolescents aged 11-15 years, has demonstrated good internal consistency (alpha 0.88) and is correlated with depression,

anxiety, self-esteem, and stress (Tait, Hulse, & Robertson, 2002). Higher scores indicate poorer mental health. The Cronbach's alphas recorded for the GHQ-12 in this study were .89 for the first time point and .90 for the second time point.

**Procedure**

The longitudinal study received ethics approval both from the university and from school authorities (see Appendix Q). The questionnaires used in this study formed part of a larger annual collection. Students completed the questionnaire within school hours and supervision was provided by teachers and research assistants involved with The Australian Character Study. All informed consent and completed questionnaires were collected and securely stored separately, so as to preserve participant anonymity.

**Analytic Procedure**

All data analysis was undertaken in statistical software program Mplus 6 (Muthén & Muthén, 1998-2010). Missing or invalid data were addressed within Mplus using full-information-maximum-likelihood estimation, which makes estimates based on all available data, rather than just those cases with data on all variables of interest, as in listwise or pairwise deletion (see Enders, 2010 for a review). The following analysis was undertaken across two sections. Section 1 involved a number of individual cross lag panel designs to test the longitudinal data. In these, the six dimensions of ER were tested individually to address the conceptual overlap that is present in many ER strategies. Each individual model tested each of the six dimensions of ER measured by the DERS, to test for antecedent, reciprocal, and consequential relationships with mental health (GHQ-12) and well-being (CDS; Figure 10; see Parker et al., 2012 for an illustrative example). An investigation of sex differences was also undertaken, where measurement invariance across time and gender was assumed.

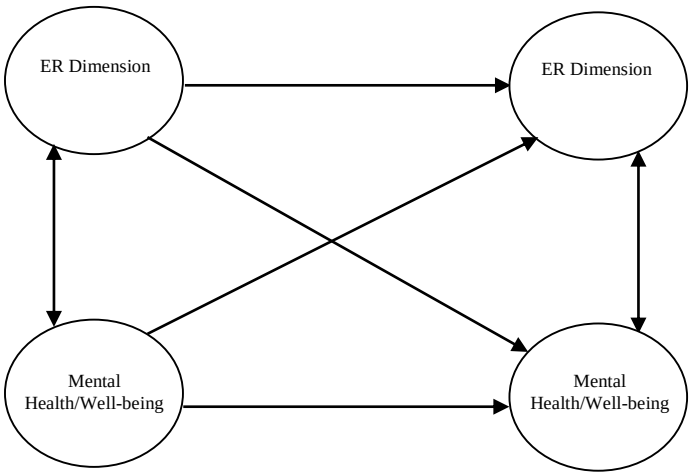


*Figure 10.* Conceptual Diagram SEM Spanning Two Time Points

The Section 2 analysis involved all of the ER dimensions (with the exception of awareness, because it was found to show low correlations with all measures; see Section 1 results), and utilised exploratory structural equation modelling (ESEM) analysis to test what is referred to here as a 'full model'. This approach allowed for testing of all the ER dimensions together, with the aim of determining which of these best predicted change in mental health and well-being across time.

## Results

### Section 1: Testing of Individual Models

We first sought to examine the simple relationships between variables. Latent correlations for the six ER dimensions, mental health, and well-being measures were calculated. Correlations between Time 1 and Time 2 latent variables revealed moderate stability over time. Interrelationships between the variables were generally moderate, with the exception of lack of emotional awareness, that consistently produced the lowest correlations across all other ER dimensions, mental health, and well-being variables (see Table 1, Appendix R).

Structural equation modelling was then utilised to investigate whether relationships between individual ER dimensions, well-being, and mental health were present. Given that many of the models (particularly those in Section 2) required the estimation of a number of parameters, and given the GHQ-12 (Goldberg & Williams, 1988) had a relatively large number of indicator items, mental health latent variables using item parcels were employed. Item parcels were derived by taking the mean of every third item, resulting in three item parcels averaging over every third. The advantages of using item parcels have been summarised by multiple authors (e.g., Bagozzi & Heatherton, 1994; Floyd & Widaman, 1995; Hau & Marsh, 2004; Hull, Lehn, & Tedlie, 1991; West, Finch, & Curran, 1995). The benefits of using item parcels include that they (a) are more reliable, (b) represent a more normal distribution, (c) allow the estimation of fewer parameters, and (d) are prone to less influence from idiosyncratic characteristics of individual items. All models were estimated with the robust maximum likelihood estimator in Mplus 6.1 to account for potential non-normality in the data (Muthén & Muthén, 1998-2006). Individual cross lag models (as seen in Figure 1) with each of the six ER latent variables (awareness, clarity, non-acceptance, strategies, impulses, goals), and well-being and mental health latent variables were examined. This allowed us to model antecedent, reciprocal, and consequential effects between Time 1 and Time 2 latent variables.

Model fits for each of the crosslag panel designs were deemed acceptable if CFI values were .90 or higher (Marsh, Hau, & Grayson, 2005), and RMSEA lower than 0.06 (Hu & Bentler, 1999). All models demonstrated acceptable fit under the stated criteria (RMSEA: Mean = .03, *SD* = .01; CFI: Mean = .97, *SD* = .01; TLI: Mean = .96, *SD* = .02), with the exception of lack of emotional clarity. Model fits across each of the four individual models with which clarity was tested (e.g., emotion, psychological, and social well-being, and mental health) did not satisfy the study's criteria for acceptability

(RMSEA: *Mean* .07; CFI: *Mean* .87; TLI: *Mean* .84). Examination of the modification indices revealed significant relationships between the residuals of items 31 *"When I'm upset I am clear about my feelings"* and 35 *"When I'm upset I know exactly how I am feeling"*. The similarity in these items was likely responsible for the poorer fit and, as a result, we correlated the residual terms of these items. This resulted in an acceptable model fit across all four of the individual models involving clarity (RMSEA: *Mean* = .03, SD = .01; CFI: *Mean* = .96, SD = .02; TLI: *Mean* = .95, SD = .02).

Each of the ER dimensions (clarity, non-acceptance, strategies, impulses, goals) at Time 1 significantly predicted change in mental health and well-being at Time 2 (Table 2). The exception to this pattern was the lack of emotional awareness dimension, which did not significantly predict changes in mental health or well-being. Reliable reciprocal relationships were also observed, with Time 1 mental illness and well-being (emotional, psychological, and social) also significantly accounting for change in ER scores at Time 2. We concluded that the results generally supported the reciprocal influence model, suggesting that response-focussed ER, well-being, and mental health mutually influence each other. Table 2 displays the correlation between residuals at Time 2, controlling for the autoregressive and crosslag effects which have been interpreted in previous research to be indicative of correlated change over time (see Parker et al., 2012 for an overview).

Table 2
*Predicting Changes in Emotion Regulation and Well-Being From Grade 8 to 9*

| | Mental Health β | Emotional Wellbeing β | Psychological Wellbeing β | Social Wellbeing β |
|---|---|---|---|---|
| *Non-Acceptance* of emotion responses | | | | |
| Non-Acceptance → Wellbeing | .11** | -.05 | -.09* | -.07* |
| Wellbeing → Non-Acceptance | .16** | -.09* | -.06* | -.06* |
| Limited access to emotion regulation *Strategies* | | | | |
| Strategies → Wellbeing | .10* | -.11** | -.12** | -.12** |
| Wellbeing → Strategies | .18** | -.17** | -.10** | -.11** |
| *Impulse* control difficulties | | | | |
| Impulse → Wellbeing | .11** | -.11** | -.10** | -.09* |
| Wellbeing → Impulse | .08* | -.10** | -.06* | -.08* |
| Difficulties engaging in *Goal* directed behaviour | | | | |
| Goals → Wellbeing | .12** | -.12** | -.12** | -.12** |
| Wellbeing → Goals | .15** | -.07* | -.02 | -.03 |
| Lack of emotional *Awareness* | | | | |
| Awareness → Wellbeing | .02 | .01 | .01 | -.03 |
| Wellbeing → Awareness | .08* | .11** | .11** | .11** |
| Lack of emotional *Clarity* | | | | |
| Clarity → Wellbeing | .07* | -.10** | -.08* | -.09** |
| Wellbeing → Clarity | .11** | -.08* | -.03 | -.06 |

* $p < 0.05$, ** $p < 0.01$. Results given in standardized beta form.

**Sex Differences**

Possible sex differences were investigated by examining whether the crosslag and auto-regression paths were different across genders. Results from a Wald test estimated via the model test command in Mplus (Muthén & Muthén, 1998-2010) suggested that in all of the tested models, only a single model showed evidence of significant differences in parameters across sex. Follow-up investigation utilising the Delta method revealed a significant difference in Time 2 Non-Acceptance of emotions on social well-being at Time 1: males β .03 $p$ = .49 and females β = -.14 $p$ = .001. No further sex differences between Time 1 and Time 2 latent variables were uncovered. Thus, there was only one significant sex difference observed across all models, and this was small in magnitude—suggesting that there was little evidence of any real sex differences in the relationship between mental health, well-being and ER over time.

**Section 2: ESEM Analysis of Five Dimensions of Emotion Regulation**

To establish whether one specific ER dimension could be distinguished as the overall unique predictor of mental health or well-being, a full model was employed. We describe it as a full model, as we use it to examine all five latent ER variables at once, against each of the well-being and mental health variables individually. To test the full model, an exploratory structural equation modelling (ESEM) approach was utilised, in preference to a traditional Independent Cluster Model-CFA (ICM-CFA). ICM-CFA models assume that population cross-loadings in a given measure are zero. This is an assumption that is likely to be violated in almost all social science measures (see Marsh et al., 2009). ESEM provides a more realistic approach by not constraining non-target loadings to be zero and, when used in conjunction with target rotation, as was done here, provides a middle ground between CFA and EFA (Marsh et al., 2009). Target rotation aims to maximise target loadings (i.e., loadings of items onto the factor they were designed

to measure) and minimize non-target loadings toward a typically low value (in this case zero; Asparouhov & Muthén, 2009). ESEM models typically provide a better fit to the data and, given that non-target loadings are not artificially constrained to be zero, less inflated latent factor correlations (see Marsh et al., 2009). ESEM was used in Section 2, as each model included five ER factors where non-target loadings were likely to be present.

The latent variable of awareness of emotional responses was previously shown to share weak non-significant relationships with other ER, well-being, and mental health variables (see Section 1 analysis). This was consistent with recent research which argued it may not represent the same higher order construct that the other dimensions of ER do within the DERS (Bardeen, Fergus, & Orcutt, 2012). As a result, it was omitted from further analysis in Section 2.

All five remaining ER dimensions were then entered into the 'full model' with relationships between Time 1 and Time 2 well-being/mental health latent variables all being examined with ESEM analysis. For purposes of comparison, and to confirm that ESEM presents as a more suitable approach, both full model CFAs and ESEM were utilised. Table 3 (see Appendix S) reveals mean model fit values, while individual model fits can be viewed in Table 4 (see Appendix T). Consistent with previous investigations, the ESEM approach fitted the data better than did the traditional ICM-CFA (Marsh et al., 2009), and resulted in reduced latent factor correlations (Table 5 and Table 6, Appendix U). Mean latent correlations were recorded for the ESEM model as being ($r$ = .23) and CFA ($r$ = .43).

**Exploratory Structural Equation Modeling Results**

ESEM analysis of the full model incorporating five dimensions of ER was employed to ascertain if one specific ER dimension could be identified as being a distinct predictor of well-being/mental health after controlling for the other ER variables. Omnibus

testing revealed significant parameters. Model fit criteria for each of the four ESEM analyses (examining ER with mental health, psychological, social, and emotion well-being) was deemed acceptable under the criteria adopted in Section 1 (Hu & Bentler, 1999; Marsh, Hau, & Grayson, 2005).

Greater difficulties engaging in goal directed behaviour while experiencing negative emotions, was found to be the most significant and unique predictor of lower levels of Time 2 social well-being (β = -.08, $p$ = .009), emotional well-being (β = -.08, $p$ = .03), psychological well-being (β = -.07, $p$ = .001) and poorer mental health (β = .08, $p$ = .007). Further ER strategies also demonstrated significant predictive relationships. Limited access to the dimension of ER strategies significantly predicted lower social well-being (β = -.07, $p$ = .04), while a lack of clarity of emotional responses (β = -.05, $p$ = .04), and non-acceptance of negative emotions (β = .08, $p$ = .02) significantly predicted mental health at Time 2.

Across Sections 1 and 2 difficulties engaging in goal directed behaviour were consistently found to be the most reliable and significant predictor of well-being and mental health in adolescents. As a result, some exploratory investigation into which other ER dimensions may be predictive of goals was undertaken. Examination of the full model ESEM output generally revealed Time 1 ‘access to strategies’ to significantly account for Time 2 ‘goals’ β = 10 $p$ < 0.001. This suggests that adolescents who firstly experience difficulty connecting with effective ER strategies may then experience greater difficulties in engaging in goal directed behaviour when experiencing negative emotions in the future.

## Discussion

The current study identified several dimensions of response-focused ER that predicted the development of mental health and well-being in adolescents. These included impulse, clarity, strategies, acceptance, and goals. Only lack of awareness failed to

demonstrate any antecedent qualities. In contrast, each of the dimensions of ER were also influenced by past mental health. In sum, the evidence from study 1 generally supports a reciprocal relationship model between multiple dimensions of ER and aspects of well-being and mental health.

While a range of reciprocal relationships were reported, the magnitude of these observed relationships varied in size. The link between all dimensions of ER (except awareness) and future well-being and mental health was moderate (between 4 to 9%). The ability of the measures to predict change in well-being and mental health from grades 8 to 9 was small, but still reliable. The change effect size estimates are conservative, in that they are based on multiple dimensions of ER predicting change across a single year for what are quite stable constructs. Nevertheless, even small effects can have important implications when they accumulate over an extended period. In addition, this model does not capture the inter-relationships between mental health and self-regulation that precede the first time wave of the study. For example, past research suggests that the development of ER prior to high school is essential (see Keenan 2000 for a review). Thus, poor ER in grade 6 may cause decreased mental health into grade 8, where this study started. Unfortunately, our model does not capture these prior effects.

As stated, a reciprocal influence model was the most consistently supported relationship, suggesting that ER, mental health and aspects of well-being all mutually influenced each other. These findings are entirely dissimilar to McLaughlin et al. (2011), whose longitudinal study with an adolescent cohort found emotion dysregulation was a clear antecedent for psychological difficulties. While an antecedent model was not confirmed in the results section, our analysis still indicated the importance of ER for ongoing adolescent mental health and well-being. The reciprocal influence model, which

suggests that all dimensions of ER (with the exception of awareness), well-being, and mental health mutually influence each other, was strongly supported.

An interesting finding in this longitudinal study was that the ER dimension of lack of emotional awareness, seemed to be largely a consequence of poorer well-being, and did not demonstrate any antecedent or reciprocal qualities. There appears to be something distinctive about the awareness dimension of regulation, in that it exhibited the weakest relationship with all other ER variables, mental health, and well-being. This finding does not appear to be an anomaly. Similar relationships have previously been recorded with the DERS awareness subscale (Weinberg & Klonsky, 2009). Whilst awareness, as measured by the DERS, did not predict time 2 mental health or well-being, the closely related dimension of clarity did. Clarity involves possessing the clarity of one's emotional responses and being able to label one's feelings. This suggests that focussing on understanding and responding to one's feelings, rather than simply being aware of them, is more important for future well-being and mental health.

In respect of the pattern of results related to the awareness subscale, potential explanations vary. It has recently been argued by Bardeen et al. (2012) that the awareness subscale of the DERS may not represent the same higher order ER construct as the other five subscales. Conversely, while mindfulness and awareness-based strategies have generally been found to be related to positive psychological outcomes, exceptions are found in the adolescent literature. Ciarrochi and colleagues (2011) found mindful observing in adolescents to be associated with higher neuroticism, fear, and sadness. This appears similar to the relationship uncovered in this study, with poorer mental health predicting emotional awareness a year later. This could suggest that untrained levels of self-awareness are reflective of an anxious attending style, possibly associated with the excessive monitoring of emotional states.

**Goal Directed Behaviour and Adolescence**

One aim of this research was to identify which dimension of ER was the most important and distinctive predictor of well-being. Identifying specific dimensions of ER which could prove amenable to intervention is especially pertinent in considering the dissemination of research findings. Analysis in Section 2, which sought to compare each of the dimensions of response-focussed ER with the other, identified one dimension of regulation as being the most important: staying in contact with goal directed behaviour whilst being upset. The overall importance of engaging in goal focussed behaviour in response to negative emotions held, both when considering ER dimensions individually (Section 1 analysis and results) and when controlling for all the other ER dimensions in the full model (Section 2 ESEM analysis and results).

Whilst difficulties engaging in goal directed behaviour during times of negative emotions proved to be the most important dimension of ER, other regulation dimensions also predicted distinctive aspects of well-being and mental health. Non-acceptance of emotions had a small and unique effect on change in mental health one year later; this is consistent with recent meta-analysis findings (Aldao, Nolen-Hoeksema, & Schweizer, 2010). At a therapeutic level, learning to accept feelings may lead to values based actions (Hayes et al. 2012), although we found no connection in our exploratory analysis to suggest that non-acceptance reduced efforts to engage in goal directed behaviour. Access to the dimension of ER strategies perceived as being effective was also found as being significantly beneficial to social well-being. This further reinforces the growing literature which supports the need to be flexible in strategy selection in response to negative emotions (Hayes et al., 2012; Nolen-Hoeksema, 2012).

Exploratory investigation of output also suggested that being able to adopt effective ER strategies resulted in an adolescent's ability to engage in goal directed behaviour one

year later. An assumption in much of the ER literature is that dimensions of regulation are independent from each other (Gross, 2014). We explored this assumption; our initial results suggest that being able to access a range of ER strategies may lead to higher levels of goal directed behaviour one year later.

**Sex Differences and Emotion Regulation**

The current study sought to address a gap in the adolescent ER literature by investigating whether any sex differences in response focussed ER were related to psychological outcomes one year later. While some sex differences in the literature involving ER have been identified previously, most of these involved mean differences in cross-sectional designs and did not address temporal ordering (Weinberg & Klonsky, 2009). Our findings revealed no significant sex differences between the multiple dimensions of ER as being responsible for differences in mental health or well-being across a one-year period in adolescents. However, we are cautious about drawing any conclusions regarding sex differences in relation to the entire developmental period of adolescence. This is because some sex differences in subjective well-being, occurring from early to mid-adolescence, have been reported previously. Girls have been reported as initially scoring higher on subjective well-being, before age related decline in well-being is seen for both sexes over time (Csikszentmihalyi & Hunter, 2003; Tomyn & Cummins 2011). Findings such as these are pertinent, as they remind us that adolescence is an extended period of tumultuous change. It is essential that future research be mindful of how any ER sex differences may be related to affective health states in adolescence.

**Implications**

Given the consistency of the reciprocal relationships discovered between engaging in goal directed behaviour, mental health, and well-being in adolescents, the implications for dissemination of results at an intervention and treatment level seem promising.

Approaches like Acceptance and Commitment Therapy (ACT) are specifically designed to teach people to mindfully experience difficult feelings and make space for them whilst pursuing their goals (Ciarrochi, Hayes, & Bailey, 2012; Hayes et al., 2012); this is a skill that seems to be measured closely by the goals subscale of the DERS. The empirical support found by this study for the importance of focussing on the regulation of dimensions such as goals, clarity, acceptance, and impulses, in future interventions, seems consistent with a recommendation by Broderick and Jennings (2012), who call for widespread mindfulness training and interventions for all adolescents as they traverse the tumultuous period of adolescence. Future research should aim to deliver and evaluate ACT and mindfulness programs that directly support goal directed behaviour and related regulation strategies.

**Limitations**

To the authors' knowledge, this is the only longitudinal study which has examined six dimensions of response-focussed ER and investigated their ability to predict the development of adolescent mental health and well-being. While the current study has many strengths and makes a considerable contribution to knowledge, it is not without some limitations. For example, our study utilised a range of self-report measures. However, our key conclusions are based on residual changes in these measures, which were inferred from the data rather than being reported by the individual. Nevertheless, future research might expand on this with further assessment measures, utilizing, for example, Experience Sampling Methods (ESM) and peer and parent observational reports. Utilising additional methods such as those suggested may allow for more in-depth examination of the emotion experience and therefore of how the regulation process occurs under different contexts (Bolger, Davis, & Rafaeli, 2003). A further potential limitation remains that some adolescents may possess only partial awareness of their emotional responses, as a

consequence of their varying developmental trajectories (Steinberg, 2014). This interesting possibility suggests that some adolescents may have failed to report their emotional strategies accurately, as they were simply not sufficiently aware of them. However, the significant findings do suggest that adolescents were able to report on some aspects of their ER that are relevant to their future mental health.

**Future Directions of Emotion Regulation Research in Adolescence**

The opportunities to further our understanding of ER processes in young people are diverse. The development and use of ER is widely reported as not occurring in isolation, and is susceptible both to external and to internal influences (Gross, 2014). Future research designs should aim to account for this complexity, and investigate the roles these influences may have in the process of regulation. Accounting for third variables that may also help to further explain the relationship between ER and mental health and wellbeing should be a focus. Socialization effects related to parental relationships, and peer interaction, have all been found to influence aspects of ER in young people (Zeman et al., 2006). Investigating the role that emotional competencies may play in social interactions and friendships, could have implications for further understanding and treating the psychological development of young people (Cole & Deater-Deckard, 2009; Kiuru, Aunola, Nurmi, Leskinen, & Salmela-Aro, 2008; Lopes et al., 2011; Wentzel, Barry, & Caldwell, 2004). Identifying which environmental influences may best support and underlie healthy ER in adolescents, is an important future direction for ER researchers (Gross, 2014).

The current study sought to investigate the importance of ER for young adolescents' mental health and well-being across time, and tested for antecedent, reciprocal, and consequential relationships. The findings indicate strong support for response-focussed regulation, mental health, and well-being as sharing a reciprocal

relationship in adolescents across a one-year period. Specifically, we were able to identify the importance of engaging in goal directed behaviours whilst experiencing negative emotions, for adolescent mental health and well-being. It is hoped that the findings from this study will reinforce the importance of ER for healthy adolescent development, and the need for future research that investigates factors which support or help maintain healthy ER in adolescents

# Chapter 7: Empirical Study 2 for Publication

## Chapter Transition Statement

The surge in research focussing on emotion regulation (ER) has been come to be known as the affect revolution (Adrian et al., 2011; Tangney & Fischer, 1995). This large body of work has focussed on a range of dimensions and strategies of ER, and their relationship with various psychological states across a range of populations. Unfortunately, until the completion of Empirical Study 1, research focussing on multiple dimensions of ER and their relationship with mental health in adolescent populations across time has been limited (see Systematic Review findings; Neumann et al., 2011).

The systematic review carried out in Chapter 5 of this thesis examined a range of current ER self-report measures and how they had been utilised by empirical research with adolescents. The Process Model was used as a means to understand the stages of regulation that each of these self-report instruments can assess. When examination of the previous empirical research was made, the need for additional research to address research design deficiencies became apparent. This included the crucial need for longitudinal research that would assist in establishing the nature and direction of the relationship between ER and mental health in adolescents.

As a result of the work done in chapter 5, it was decided that Empirical Study 1 would investigate whether a subset of response-focussed ER dimensions could uniquely and reliably predict mental health and well-being in adolescents. After extensive testing, the results revealed that the ER dimensions assessed generally shared a reciprocal relationship with mental health and well-being. Engaging in goal directed behaviour whilst experiencing negative emotions was also consistently identified as the most important

dimension of ER. This is consistent with a theoretical shift toward recognising the importance of ER styles that are flexible and value based responses to negative emotions.

In one respect, Empirical Study 1 was consistent with much of the past research, that has focussed on the relationships that individual dimensions of ER may share with various dimensions of mental health. Unlike other research however, Empirical Study 1 was able to test for causal relationships by using a large longitudinal design, in conjunction with robust statistical methods. The next step in the designated research project which unifies this thesis is to recognise that theoretically, the process of ER does not simply occur in isolation (Aldao, 2013; Bonanno & Burton, 2013; Gross, 2014; Gross & Thompson, 2007; Fosco & Grych, 2012). Indeed, a number of social or environmental factors have been hypothesised as being influential in supporting healthy ER in adolescents (Riediger & Klipker, 2014).

Social proximity or interaction with others is increasingly being recognised as having the potential to alter how one regulates one's emotions (Coan & Maresh, 2014). Interpersonal interactions such as receiving support from important individuals such as parents, peers, and various adults within the community, have all been suggested as having the capacity to influence how an adolescent regulates their own emotions (Gross, 2014; Lourel et al., 2013). Recent reviews have called for an investigation of how these sources of support that are present in an adolescent's social context, may be related to their ER functioning (Aldao, 2013). The following empirical study aims to test whether the social support from people with whom adolescents enjoy important daily interactions, may positively support their ER, and how this may be related to their mental health across time.

Empirical Study 2 aims to address a gap in the literature. The role of social influences from individuals in the adolescent's environment and how these may affect their ER have been largely overlooked by much of the past ER focussed research (Lourel et al.,

2013; Marroquín, 2011). As summarised in the introductory chapters, Marroquín (2011) proposes that there is the potential for ER to mediate social support and its relationship with mental health. This is consistent with the understanding that ER does not just occur in isolation and can be affected by other individuals through supportive behaviours, modelling, and other forms of influence (Gross, 2014). As a result, the object of Empirical Study 2 is to test a mediational model. This will establish whether sources of social support from important individuals within an adolescent's life can help them regulate their emotions, and in turn positively influence their mental health across time.

To test appropriately for any mediating relationships as proposed here and earlier in the thesis, 3-waves of data is considered preferable, from a statistical modelling standpoint (Kline, 2011). This is because many proposed mediation relationships are wrongly tested with single time point designs (Kline, 2011). However, the costs and time involved in undertaking such large scale research to test mediation appropriately, most likely proves as a deterrent. As a result, the following study builds on Empirical Study 1 by measuring social support (from a range of sources close to an adolescent) and testing its effect on multiple dimensions of ER and a global measure of mental health across a three-year period. The same cohort from Empirical 1 will again be tested with a newly collected third wave of data. With this research design it is possible to appropriately assess whether any dimensions of ER may mediate a relationship between social support and adolescent mental health.

Empirical Study 2 seeks to achieve a number of important goals: Firstly, to answer the growing calls to include prominent social factors in the research designs that are used to investigate ER (Aldao, 2013; Gross, 2014; Fosco & Grych, 2012). Secondly, it allows for an investigation as to whether social support and the most important dimensions of ER identified in Empirical Study 1 (e.g., goals and access to strategies) are related. This is

important, as lower parental social support has previously been found to be associated with suppressing emotions in young people (Graham, Huang, Clark, & Helgeson, 2008; Srivastava, Tamir, McGonigal, John, & Gross, 2009). Previous longitudinal research has also found parental social support to be related to adolescent depression but not to emotion dysregulation (Larsen et al., 2012). This suggests that social support may have a direct relationship with depression in adolescents which is not mediated by emotion regulation. A key limitation of the study by Larsen and colleagues (2012) is that it did not examine the effects of social support from close friends and did not use a comprehensive measure of ER. As adolescence is considered a time of increasing independence that, in some cases, includes a shifting outward focus from parents to friends, it is important to examine the effects that social support from close friends may have on an adolescent's ability to regulate their emotions during distressing times (Gross, 2013). Finally, as mentioned, Larsen et al. (2012) did not utilise a comprehensive measure of ER such as the one that is used in this thesis, both in Empirical Study 1 and here again in Empirical Study 2 (e.g., DERS; Gratz & Roemer, 2004).

The following study takes a comprehensive approach, building on Empirical Study 1 and addressing the gaps in previous ER research with adolescents. It investigates relationships between close friends, parental, and teacher social support, and six dimensions of ER and adolescent mental health. The inclusion of multiple sources of social support also allows for the determination of whether one source of social support is more critical for ER and mental health in adolescents than another. The three wave longitudinal design allows for all direct and mediated relationships and longitudinal linkages to be tested appropriately. Empirical Study 1 clarified the direction of the relationship between a number of ER dimensions and mental health and well-being. It also served to identify which dimensions of ER were the most important, across a one-year period. The following

empirical investigation builds on this and will make a significant contribution to the field by investigating how salient social factors may influence ER and be related to mental health in adolescent populations.

# Social Support and its Relationship with Adolescent Emotion Regulation and Mental Health: A Three Year Longitudinal Investigation

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## Statement of Contribution

I acknowledge that my contribution to the following paper as the lead author is 85%.

Dr Philip Parker, Professor Patrick Heaven and Professor Joseph Ciarrochi's contributions are weighted as 5% each.

**Abstract**

Research focussing on individual dimensions of emotion regulation (ER) and psychological functioning in adolescence has highlighted the importance of healthy regulation. In recent times, recognition that other influential factors may affect the process of ER has grown. Influences such as interactions with and support from important figures in an adolescent's life have been suggested as being related to the development and maintenance of healthy regulation in adolescents. We collected self-report ratings of ER, three forms of social support (parent, teacher, and close friend) and mental health measures across three years. Participants in the study were adolescents who completed each of the measures from Grades 8 to 10 ($N$ = 2,070; males = 1,019; females = 1,051). Structural equation modelling (SEM) was used to examine relationships between each of the latent variables. Strong reciprocal relationships were discovered between multiple dimensions of ER and poorer mental health. Further analysis confirmed that parents were the most important sources of social support for adolescents' mental health across time. Regardless of the source, social support did not predict an adolescent's ability to regulate their negative emotions. Parental social support did, however, directly predict the development of mental health. This study's findings reaffirm the importance of the healthy regulation of emotions for mental health in adolescence, whilst also highlighting the critical role that parental social support holds for adolescents' mental health.

*Keywords:* emotion regulation, adolescence, mental health, social support

## Social Support and its Relationship with Adolescent Emotion Regulation and Mental Health: A Three Year Longitudinal Investigation

The popularity of the construct of emotion regulation (ER) has been growing rapidly in the last two decades (Gross, 2013). This strong and sustained growth has led to ER being considered as one of the fastest growing areas of research within psychology (for reviews see Gross, 2014; Koole, 2009; Tamir, 2011). Unfortunately, ER research that focusses on adolescent populations has been somewhat overlooked. As a result, the need for comprehensive longitudinal studies to address this has been recognised (Riediger & Klipker, 2014). A systematic review (Forsyth, Hayes, Parker, & Ciarrochi, Manuscript in preparation for submission) has highlighted the need to investigate how regulatory responses to negative emotions are related to adolescent well-being and mental health across time. Understanding how these regulatory responses may interact with and be influenced by individuals from within an adolescent's social context, is a key goal of this study.

The developmental stage of adolescence presents as an exciting opportunity to examine the effects of ER on psychological functioning. Furthermore, accounting for how influences within the adolescent's social context may impact their regulation, is also critically important (Aldao, 2013; Riediger & Klipker, 2014). This is because adolescence is a time of transition to independence. Throughout this developmental period a range of sources, including parents and peers, may influence regulation styles and competencies in adolescents (Riediger & Klipker, 2014; Steinberg, 2014). We examine the direct effects of both ER and multiple sources of perceived social support on adolescent mental health. Finally, we also investigate whether ER may mediate a relationship between social support and mental health, as recently proposed in an influential review (Marroquín, 2011).

Adolescents have been found to experience their emotions differently from adults and children (Riediger & Klipker, 2014; Riediger, Wrzus, & Wagner, 2013; Steinberg, 2014). They experience more negative emotions more frequently, react strongly to emotion-eliciting situations, and fluctuate more rapidly within emotional states (Larson, Moneta, Richards, & Wilson, 2002; Riediger, Schmiedek, Wagner, & Lindenberger, 2009; Riediger, Wrzus, & Wagner, 2013; Stroud et al., 2009). The regulation strategies which young people access to manage their emotion experiences are therefore critically important to their healthy psychological functioning. The core features of ER can be understood as the extrinsic and intrinsic processes which may influence how one responds (deliberately or otherwise) with a range of strategies, to modify or change how emotions are experienced (Gross & Thompson, 2007). The process of regulation can occur at various stages of the emotion cycle, and is generally undertaken whilst working towards a goal (for a review of definitions see Bloch, Moran, & Kring, 2010).

**Emotion Regulation and Adolescent Mental Health**

There is empirical evidence that suggests ER strategies, utilised individually and within repertoires, may have direct effects on psychological functioning in adolescents (Gross, 2014; Lougheed & Hollenstein, 2012). Various regulatory strategies have been found to be related to a range of psychological outcomes, including antisocial behaviour, risk taking, and aggression in children and adolescents (Eisenberg et al., 2001; Frick & Morris, 2004; Kim & Cicchetti, 2010; Morrongiello, Kane, McArthur, & Bell, 2012; Neumann et al., 2010; Röll, Koglin, & Petermann, 2012), as well as internalizing issues such as depression, and anxiety (Garber, Braafladt, & Weiss, 1995; Garnefski, Kraaij, & van Etten, 2005; Neumann, van Lier, Gratz, & Koot, 2010; Silk et al., 2003; Suveg, Hoffman, Zeman, & Thomassin, 2009). While these findings are indicative of the importance of healthy regulation for adolescent development, a substantial proportion of

these findings are the products of cross-sectional research, thereby precluding temporal ordering from being established.

The limited longitudinal research that has focused on adolescent populations has served to highlight the importance of the ER construct. Adolescents who experience poorer clarity of their emotions and have difficulty identifying them, have been found to suffer both decreased positive affect and poorer social support one year later (Ciarrochi, Heaven, & Supavadeeprasit, 2008). Strategies such as acting with awareness, emotional awareness, and experiential acceptance, have also been found to significantly predict well-being in adolescents (Ciarrochi, Kashdan, Leeson, Heaven, & Jordon, 2011). Furthermore, McLaughlin, Hatzenbuehler, Mennin, and Nolen-Hoeksema (2011) found they could predict psychopathology seven months later in adolescents, by using a latent unitary variable labeled as emotion dysregulation (which included emotional understanding). Taking these findings collectively, it would appear that the ability to regulate emotions successfully in young peoples' lives over time (using a range of strategies) can be directly related to well-being and psychopathology.

Whilst the need for further longitudinal research focussing on adolescent ER has been emphasised, Fosco and Grych (2012) point out that social contextual factors (from a historical standpoint) which may influence the process of ER have unfortunately been studied separately. Thompson (2014) has also recently stated that social influences associated with regulation have the potential either to facilitate or hinder an adolescent's emotional self-control. Aldao (2013) has also recently emphasised the need to account for the interpersonal context in future research focussing on the process of ER. It is therefore imperative to examine how the people around adolescents may support or influence their regulatory responses when experiencing negative emotions. This study aims to investigate the direction and magnitude of the relationship between ER and mental health, whilst also

examining how social support may influence the regulation process. It examines whether social support from important sources may serve to underlie healthy regulation and, if so, which sources of social support are the most important? Two main approaches to understanding the effects of social support on ER and mental health are now discussed. The theoretical basis and considerations behind each of these perspectives will now be presented.

**The Direct Effects Model of Social Support**

Social support has long been emphasised as being critically important to social and psychological outcomes in young people. The Direct Effects Model of social support proposes that social resources will have a positive effect on an individual's well-being, regardless of stress (Cohen & Wills 1985; Demaray & Malecki, 2002; Lakey & Cohen 2000). Social support is defined as one's perceptions of supportive behaviours from various sources, which may include parents, teachers, and peers. These perceptions or interactions with social support providers may support psychological functioning, such as ER, or even buffer against adverse outcomes (Malecki & Demaray, 2002; Malecki & Demaray, 2006).

Parents are considered especially vital sources of social support, as they can exert influence from birth onwards, through behaviours such as soothing emotions, modelling emotional competency, and managing daily situations (Thompson, 2014). Furthermore, they are also responsible for critical factors which may shape the emotional climate of a young person's family life, such as economic security and marital disruption (Riediger & Kliper, 2014). The risks of not receiving sufficient or appropriate support from parental sources at home are two-fold. Adolescents potentially are not able to cope adequately during times of emotional distress, and consequently they experience poorer well-being. Additionally, adolescents may then seek out that support elsewhere, and become more

susceptible to negative peer influences (Barber, 1996). As a result, parents have been identified as the most influential emotional source for adolescents (Halberstadt, 1991).

While parents may be recognised as being the most influential source of emotional support, the question remains, does that influence start to wane throughout adolescence? For instance, as a young person matures, do they start to place more weight on the social support they receive from sources other than their parents? If so, this may result in a transference of direct effects to other individuals within the adolescent's network of support providers. Adolescence is characterised by young people seeking independence, spending increasing time with peers, and considering their futures, so the importance of educators and close friends as sources of support has the potential to increase (Gross, 2014; Steinberg, 2014).

Social support from friends, family, and teachers has all been found to have a statistically significant relationship with self-esteem in Turkish adolescents (Ikiz & Cakar, 2010). Demaray and Malecki (2002) have reported significant correlations between perceived social support (parent, friend, and teacher) and a range of behavioural, academic, and social outcomes. Supportive non-parental adults (other than teachers) may also help with some young peoples' emotional competencies and psychological functioning. Sterrett, Jones, McKee, and Kincaid (2011), in an extensive integrative review, found perceived support from non-parental adults to be related to various behavioural, social, and emotional outcomes in adolescents. Parker and colleagues (2012) found parental support, rather than friend support, to be the most important for adolescents who were transitioning into adulthood.

Regardless of the actual source of perceived social support, and consistent with the Direct Effects Model of social support, it is expected that higher perceived support from all sources will be associated with improved mental health and ER in adolescents. The current

study intends to compare the individual effects of social support from teachers, close friends and parents, on mental health and on ER. This will enable comparisons between these three sources of support across time, to establish which is the more important across the period of mid-adolescence.

**Does Emotion Regulation Mediate Social Support and Mental Health?**

There have been many strong proponents of the Direct Effects Model of social support over the past decades (Cohen, Underwood, & Gottlieb, 2000; Lourel et al., 2013). However, it has also been proposed that social support can instead have an indirect effect which may be mediated or partially mediated (Lourel et al., 2013; Wills & Fegan, 2001). Recently, in an influential review, Marroquín (2011) argued that ER presents as a potential mediator between social support and depression. Marroquín (2011) argued that ER development is closely linked to parental and family influences experienced early on in development, with peer influence becoming more important with time. As a result, Marroquín (2011) strongly makes the case that if "ER (a) has consequences for symptomatology and (b) is sensitive to interpersonal influences, then it represents as a candidate mechanism to account for the effects of relationships on depression" (p. 1280).

Some support for ER as a mediator can be found in the empirical literature for psychological issues beyond depression. McEwen and Flouri (2009) reported that ER mediated fathers' psychological control and emotional symptoms in a cross-sectional population of socially disadvantaged 11-18 year olds. Some further empirical studies have revealed that young adolescents' maladaptive emotion regulation and depression is mediated by parental supportive behaviours (Yap, Allen, & Ladouceur, 2008; Yap, Allen, Leve, & Katz, 2008). Unfortunately, these studies were not longitudinal, and failed to conclusively distinguish the particular source of social support that was the most important throughout adolescence. The previous related research has also been restricted to

investigating the question of mediation in smaller samples and inadequate research designs. The current study used a large multi-year three time point longitudinal design that allowed for both direct and mediation effects to be rigorously examined. The adopted design also allows for the identification and comparison of which source(s) of social support is the most important for the healthy regulation of emotion and mental health in adolescents.

We therefore aimed to compare a Direct Effects Model versus the Mediation Effects Model as hypothesised by Marroquín (2011). In line with the Direct Effects Model of social support we predicted that higher levels of all social support would result in improved ER and mental health in adolescents. Likewise, in line with our previous findings, we predicted that difficulties in regulating emotion would be reciprocally related to poorer mental health in adolescents (see Forsyth et al., manuscript in preparation for submission). Alternatively, for the mediation hypothesis, we predicted that ER would mediate the relationship between social support and mental health in adolescents. Aside from testing for direct and mediation effects, a further aim was to investigate which forms of perceived social support were the most important to adolescent mental health and ER.

## Method

### Participants

Participants were students from Australian secondary schools that participated annually in a large longitudinal study called the Australian Character Study (ACS). Participant data was recorded at three time points. Wave 1 ($N$ = 2,070; male = 1,019, female = 1,051) recorded students from Grade 8 (Mean age = 13.72, $SD$ = .44). Wave 2 ($N$ = 1842; male = 1084, female = 758) comprised students from Grade 9 (Mean age = 14.64, $SD$ = .44) while Wave 3 ($N$ = 2002; male = 1007, female = 995) compromised students from Grade 10 (Mean age = 15.65, $SD$ = .44). Students from 17 secondary schools

participated. Informed consent was acquired prior to the commencement of the study. Participation was voluntary and without financial incentive. Background information was gathered for each of the adolescents. Parents' marital status was reported as 74% married, 8% separated and 11.8% divorced; 6.3% reported their marital status as other. Father's reported occupation status at Time 1 was assessed as 1.2% pensioner/homemaker, 22.6% professional, 15.9% trades, 16.4% labourer, transport, production related, 4.8% community service, 4.8% sales clerical and 8.4% not reported. Reported occupations for mothers at Time 1 were 9.4% pensioner/homemaker, 22.4% professional, 4.3% trades, 4.5% labourer, transport, production, 9.3% community service, 17.1% sales clerical; 7.8% of occupations were reported as other.

## Measures

### *Difficulties in Emotion Regulation Scale (DERS)*

The DERS (Gratz & Roemer, 2004; see Appendix D) is a widely used 36-item self-report instrument designed to assess difficulties in regulating emotion (Bardeen, Fergus, & Orcutt, 2012). The six subscales within the DERS are aimed to measure an individual's flexible use of situationally appropriate strategies as a response to negative emotions (Gratz & Roemer, 2004). The DERS has been found to correlate strongly in adolescence with experiential avoidance, depression, anxiety, suicidal ideation, alcohol and drug use (Weinberg & Klonsky, 2009). The six clinically relevant DERS subscales consist of (a) lack of awareness of emotional responses (e.g., When I'm upset I pay attention to how I feel); (b) lack of clarity of emotional responses (e.g., When I'm upset I am confused about how I feel); (c) non-acceptance of negative emotional responses (e.g., When I'm upset, I feel like I am weak); (d) limited access to emotion regulation strategies perceived as effective, or a passive, inflexible response to emotions (e.g., When I'm upset, my emotions feel overwhelming); (e) difficulties controlling impulses when experiencing negative

emotions (e.g., When I'm upset, I have difficulty controlling my behaviours); (f) difficulties engaging in goal directed behaviour when experiencing negative emotions (e.g., 'When I'm upset, I have difficulty getting work done). The DERS has been validated in an adolescent population aged 11-17 years (Neumann et al., 2010). Items on the questionnaire used in the current study were coded and calculated, with higher scores indicating greater difficulties regulating emotion. Cronbach's alphas across the three time points for each of the six subscales ranged from .85 to .88 for non-acceptance, .83 to .86 for goals, .88 to .90 for impulse, .81 to .85 for awareness, .86 to .89 for strategies, and .65 to .74 for clarity.

***Student Social Support Scale***

Support from parents, teachers, and close friends was measured with items taken from the Student Social Support Scale (SSSS; Nolten, 1994; see Appendix V). The original scale was designed to assess young peoples' perceived social support from parents, teachers, close friends and peers (Malecki & Elliott, 1999). The current study took the top seven loaded items previously identified by Malecki and Elliot (1999) for each of the parent, teacher, and close friend's scales. An example of a Parental Support item used in this study is "My parents help me make decisions." An example of a teacher support item is "My teacher(s) is fair to me" and an example of an item from the close friend's subscale is "My close friends(s) give me advice". Items are rated on a 6-point Likert Scale ranging from 1 = *Never* to 6 = *Always*. Cronbach's alphas for each of the three waves ranged from .93 to .94 (Parents), .93 to .95 (Teachers), and .93 across all three waves for close friends.

***Mental Health***

The General Health Questionnaire (GHQ-12; see Appendix P) is a broad measure of current mental health (Goldberg & Williams, 1988). An example item is: "Have you recently been losing confidence in yourself?" The GHQ-12 is completed and scored along

a Likert scale ranging from 1 to 4. The GHQ-12 has been validated with adolescents aged 11-15 years, and has demonstrated good internal consistency (alpha = 0.88). It is also correlated with depression, anxiety, self-esteem, and stress (Tait, Hulse, & Robertson, 2002). Higher scores indicate poorer current mental health. The Cronbach's alphas recorded for the GHQ-12 across the three time points ranged from .89 to .90.

**Procedure**

The current study received ethics approval from university and school authorities (see Appendix Q). As previously mentioned, the questionnaires used in this study form part of a larger annual collection called the Australian Character Study (ACS). Students completed the questionnaire within school hours. Supervision was provided by teachers and research assistants involved with the ACS. All informed consent and completed questionnaires were collected and stored separately, so as to preserve participant anonymity (see Appendix N for a copy).

**Statistical Analysis**

All data analysis was undertaken in the statistical software program Mplus 6 (Muthén & Muthén, 1998-2010). Data for the following study was nested. We accounted for this nested structure within Mplus via the Type = Complex command. This estimator adjusts standard errors for the effects of clustered data while providing for more appropriate tests of significance (see Hox, 2010 for a general introduction). Missing or invalid data were addressed within Mplus using full-information-maximum-likelihood estimation, which makes estimates based on all available data, rather than just those cases with data on all variables of interest, as in listwise or pairwise deletion (see Enders, 2010 for a review). All analyses were conducted with latent variables.

Analysis involved a number of individual cross lag designs to test the 3-wave longitudinal data (see Figure 1 Appendix W). In each of these cases, with each of the six

dimensions of ER, three sources of social support (parent, teacher, and close friend), and mental health were measured individually to test for antecedent, reciprocal, and consequential relationships. This resulted in a total of 18 fitted models. As a result, in order to account for the number of fitted models, effects were only reported if they were statistically significant at $p < .01$ and if standardized regression coefficients were $\beta \geq 10$. Reporting effects under these criteria is consistent with related research (Neyer & Asendorpf, 2001; Roberts, Caspi, & Moffitt, 2003; Sutin & Costa, 2010). Model fits for each of the crosslag panel designs were deemed acceptable if Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI) values were .90 or higher, and RMSEA lower than 0.06 (Hu & Bentler, 1999; Marsh, Hau, & Grayson, 2005).

### Tests of Invariance and Structural Models

Tests of invariance were undertaken across models. We used the criteria of Cheung and Rensvold (2002) who suggest invariance between nested models if $\Delta$CFI is $\leq .01$ (we utilised the same criteria for the TLI) and the criteria described by Chen (2007), who suggested invariance between nested models if $\Delta$RMSEA is $\leq .015$. To test our hypothesis, we tested two models, to establish which was the most parsimonious. Model 1 maintained all autoregression paths but constrained cross-lag effects to just single year spans. Model 2 constrained all autoregression and crosslag effects to be consistent across the three waves of data.

## Results

### Changes in Constructs Over Time

Means and standard deviations for the variables at each of the three time points are reported in Table 1 (Appendix X). Mean scores for each of the latent variables remained stable across the three data collection points. As the current study involved a large population of adolescents sampled across three time points, the issue of attrition was a

concern. Comparisons between mean scores were undertaken for each of the key variables across the three waves of data. Effect sizes were small for all comparisons ($d \leq .10$).

**Measurement Invariance Across Time**

Firstly, testing of measurement invariance across each of the models was undertaken. The results can be viewed in Tables 2-4 (Appendix Y). The criteria for testing invariance between nested models was $\Delta$CFI is $\leq .01$ (we utilised the same criteria for the TLI) and the criteria described by Chen (2007) who suggest invariance between nested models if $\Delta$RMSEA is $\leq .015$. All models showed evidence of measurement invariance over time (see Tables 2-4 Appendix Y).

**Evaluation of Structural Models**

We tested two distinct SEM models. Model 1 maintained all autoregression paths but constrained cross-lag effects to just single year spans. Model 2 constrained all autoregression and crosslag effects to be consistent across the three waves of data. Both models tested, fitted well (Tables 5-7, Appendix Z). Model 2 had excellent fit, in line with the previously stated criteria for assessing fit, and had not changed much in comparison to Model 1 (baseline model). This strongly suggests that the relationship between the various sources of social support, ER, and mental health had consistent developmental effects across time. Model fits were all deemed appropriate by the model fit criteria, with Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI) values of $\geq .90$, and RMSEA lower than 0.06 (Hu & Bentler, 1999; Marsh, Hau, & Grayson, 2005). As a result, Model 2 that constrained all autoregression and crosslag effects to be consistent across three waves of data, was judged to be the most appropriate and parsimonious. All of the following results reported in the following section are derived directly from this SEM model (see Tables 5-7 in Appendix Z for comparisons).

**Direct and Mediation Effects for Social Support and ER**

The following sections report evidence from each of the 18 structural equation models in regard to the two distinct hypothesised relationships. This includes examining whether unique direct effects exist between social support and mental health, and ER and mental health. The second hypothesis, informed by Marroquín (2011), as to whether ER presents as a potential mediator between social support and mental health is also addressed here. On examination of all models, no evidence of mediation was observed between any of the latent variables (see Supplementary Material F for diagrams of all models and effects). Social support showed no significant effects on any of the six Time 2 ER dimensions. Conversely, many other direct and reciprocal effects were observed.

In the following section we report on all significant ($\beta \geq .10$; $p < 0.01$) crosslag effects. All effects for each of the longitudinal linkages across each of the 18 fitted models can be viewed in the supplementary material section (Supplementary Material F). As a matter of diligence, multi-group analysis was also undertaken, to ascertain whether there was any evidence present of an adolescents' family marital status or sex presenting as a significant moderator. Evidence for moderation by marital status was not found; nor was there strong evidence for sex moderation.[1]

**Parental Social Support, ER, and Mental Health**

Across all models involving parental support, it was found that higher levels of parental social support significantly predicted better levels of mental health one year later ($\beta = -.10$ to $-.14$ $p < .001$). Parental support was not found to significantly predict any of

[1] Moderating effects of sex found in some of the 18 models revealed very small, significant differences of higher parental social support between Times 2 and 3 for males. The stability of mental health in females was slightly greater than males across Times 2 to 3: $p < .01$.

the six dimensions of ER. Significant reciprocal relationships between each of the regulation dimensions and poorer levels of mental health (with the exception of impulse and awareness) were observed ($\beta = .11$ to $.17$ $p < .001$). Limited access to the dimension of ER strategies proved the strongest predictor of poorer mental health one year later, on both occasions in adolescents ($\beta = .17$ $p < .001$).

**Teacher Social Support, ER, and Mental Health**

Teacher social support was found to significantly predict better mental health, but only on two of the six models ($\beta = -.10$ $p < .001$). Across all three waves of collected data higher levels of teacher social support failed to significantly predict any of the six possible ER dimensions. Greater difficulties in regulating emotion or mental health did significantly predict support from teachers. As in the previous results, strong significant reciprocal relationships were observed between each of the regulation dimensions (with the exceptions of impulse and awareness) and mental health across the three time points ($\beta = .11$ to $.18$ $p < .001$).

**Close Friend Social Support, ER, and Mental Health**

Across each of the six models, close friend social support was not found to significantly predict adolescent mental health across any of the time points. Close friend social support failed to significantly predict difficulties in regulating emotion, or adolescent mental health. Difficulties regulating emotion did not predict close friend support across any of the models. As with the previous models, strong reciprocal relationships were observed across the three time points between ER and mental health ($\beta = .11$ to $.18$ $p < .001$) with the exceptions of impulse and awareness.

## Discussion

We aimed to examine, in a large population of adolescents, the relationships between three key variables across three years. To do this we tested for relationships based

on two hypotheses. The first proposed that unique direct effects would exist between social support and mental health as well as emotion regulation (ER) across time. The second hypothesis proposed that ER would mediate the relationship between social support and adolescent mental health across a three-year period. We also aimed to determine whether one source of social support would prove to be more important by supporting an adolescent's ER or mental health across time.

We generally found the strongest support for the direct effects hypothesis (involving social support), with higher perceived social support from parents and teachers resulting in significantly improved mental health across time, although social support was not found to significantly predict an adolescent's ability to regulate their emotions across any of the six assessed dimensions of ER. Multiple dimensions of ER were found to hold significant reciprocal relationships with mental health over time. No evidence was found that ER mediates the relationship between social support and mental health across time. As a result, the mediation hypothesis proposed by Marroquín (2011) was not found to be supported by this study.

A further aim of the current study was to identify which source of perceived social support was the most important to adolescents. As no evidence was recorded for social support having an effect on ER, conclusions can only be made on the basis of its importance for an adolescent's mental health across time. It was found that higher levels of perceived parent and teacher social support resulted in significantly improved mental health in adolescents. Parental social support proved the strongest and most reliable source of support for predicting adolescent mental health across all models. This was followed by perceived teacher social support. Surprisingly, close friend support was not found to significantly predict adolescent mental health across any of the models. These results support previous findings and theorising which emphasise the importance of parents as

being the critical source of social support in young peoples' lives (Halberstadt, 1991). A critical distinction is that while social support was found to predict mental health, it was not found to share either direct or reciprocal relationships with any of the six dimensions of ER (please see all longitudinal linkages for the 18 fitted models in Supplementary Materials F).

Of the six ER dimensions that we tested, it was again found that access to situationally appropriate strategies and the ability to work towards goals even whilst experiencing negative emotions, were the two most important regulation dimensions. This finding is consistent with Forsyth et al's. findings (manuscript submitted). On the basis of these results, it would appear that difficulties regulating emotions do not appear to be a direct risk factor for poorer mental health. Rather, difficulties in regulating emotion in adolescence appear to occur in conjunction with poorer mental health over time. As a large part of the research base has looked at ER in adolescents cross-sectionally, this study has provided further insight into the direction and magnitude of the relationship between six ER dimensions and mental health across time. Strategies promoting flexible responding and goal directed behaviour appear to be the most important across time. This supports the theoretical shift toward the emphasis of regulatory responses that are flexible and value driven in nature, rather than those focussed on suppressing and modulating negative emotions (Hayes et al., 2012). Nonetheless, exploring the potential role of third variables that could help explain the relationship identified here between ER and mental health should be undertaken. Gross and John (2003) suggest that those exhibiting better regulation styles may also prove to be higher on optimism and self-efficacy.

Confirmation that for young adolescents a nurturing and supportive parental source can assist in supporting mental health will be of obvious interest to family and adolescent focussed clinicians. Child-parent relations and interactions have long been recognised as an

important factor for adolescent outcomes (Fosco & Grych, 2012; Riediger & Klipker, 2014; Schwartz, Sheeber, Dudgeon, & Allen, 2012). Our findings highlight the importance of parental social support (and, to a lesser extent, teacher support), as being significantly important to adolescent mental health. Therefore, informing parents to their continual importance as social support providers will have valuable implications within the family therapy sphere.

The current study has a number of strengths: these include the use of rigorous and powerful methods of statistical analysis within a large sample across three time points. This has allowed us to make temporal ordering-based conclusions as a result. Furthermore, by investigating the role of social support alongside ER, we have addressed recent calls for the inclusion of social factors into research that focusses on the process of ER (Aldao, 2013; Fosco & Grych, 2012). As previously mentioned, our findings did not support the existence of ER as a mediator of social support and mental health, as proposed by Marroquín (2011). While our results failed to find support for mediation, it should be noted that Marroquín (2011) did specify that multiple interpersonal influences and ER may be related to depression. We utilised the GHQ-12 (Goldberg & Williams, 1998), a measure which has been found to correlate with a range of self-reported measures of psychopathology (Tait, Hulse, & Robertson, 2002). Perhaps a more depression-specific measure of self-report could be considered by future researchers who choose to explore this question further. A limitation of the current study centres around the inability of our measure of social support to distinguish which specific parent was the most important source of social support. Parent-specific findings have previously been reported, with aspects of fathering taking precedence over that of the maternal care giver in some areas of adolescent psychological functioning (McEwen & Flouri, 2009). While we were able to identify parental social support as being critically important, we were unable to assess if it

were maternal, paternal, or a combination of both that could be considered as the optimal source of social support.

When the results are interpreted collectively, a poorer ability to regulate emotions is reciprocally related to adverse mental health outcomes in adolescents. Individuals are free to use a variety of strategies to regulate emotions throughout their daily lives, and adolescence is a time where individuals reportedly build a repertoire of these regulation skills (Eschenbeck, Kohlmann, & Lohaus, 2007; Gullone Hughes, King, & Tonge, 2010). This is perhaps reflected by the significant changes in the brain which occur throughout adolescence (Dahl, 2004; Steinberg, 2010; Steinberg, 2014). Understanding how regulation strategies are selected and function together, is the next logical step in understanding how regulation develops and is applied throughout adolescence. Lougheed and Hollenstein (2012) have recently utilised Latent Profile Analysis (LPA) as a statistical approach to explore this question. Exploring the flexible use of a repertoire of regulation strategies and how these may further interact with social factors within an adolescent's environment, should be a goal for future research. This will allow for a more comprehensive examination of the flexibility associated with regulation.

The findings from the current study have revealed support for two primary relationships. Firstly, the Direct Effects Model of social support, with parental and teacher social support, predicts improved adolescent mental health over time. Secondly, difficulties regulating emotion hold strong reciprocal (rather than direct) relationships across time with adolescent mental health. This would suggest that while social support is significantly important for mental health, it has no effect in helping adolescents to regulate their emotions. Emotion regulation (ER) should therefore be targeted separately through psychological interventions, to maximise healthy psychological functioning in young people. The implications for family-based therapy and psychological interventions

focussing on adolescent mental health are self-evident. This research has been amongst the first to comprehensively examine social support alongside adolescent ER and mental health, on such a large scale. Future investigations should seek to understand how different factors from the adolescent social context may influence the selection and use of regulation strategies in adolescents.

## Chapter Transition Statement

This stage of the thesis marks the completion of the three major pieces of scholarly work that are intended for publication. These consist of a systematic review and two major empirical studies which together, have contributed to the logical progression of this thesis as a whole, and informed both its structure and underlying narrative. The systematic review served to assess the current self-report measures of ER and review the current empirical landscape. It helped highlight the need for extensive longitudinal research and informed the selection of the self-report measure for the empirical component of this thesis. The use of the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) in both empirical studies has allowed the comprehensive examination of multiple dimensions of ER. As discussed in the introductory chapters, being able to respond to a range of emotions with acceptance, flexibility, and goal-directed behaviour has been found to be vitally important for healthy psychological functioning in adults (Hayes et al., 2012; Nolen-Hoeksema, 2012; Valdivia-Salas et al., 2010). The empirical components of this thesis have revealed that these regulatory processes are also important for healthy well-being and mental health in adolescents across time as well.

The completed empirical studies are substantial contributions to the field of developmental psychology focussing on the period of adolescence. Large scale longitudinal investigative studies which involve adolescent populations and focus on the process of ER are rare. As a result, the empirical components of this thesis have expanded the existing literature base. They illustrate the importance of the process of ER for the ongoing healthy psychological development of adolescents. Furthermore, while social factors have been argued as influencing the process of ER, Empirical Study 2 has revealed

that social support does not present as one of these factors. Rather, increased social support was found to hold its own positive influence on adolescent mental health over a three-year period. Empirical Study 2 therefore confirms that social support and ER both have their own unique effects on adolescent mental health.

This stage of the thesis now marks a transition from the testing of pertinent research questions to explaining what the obtained findings mean for the area of adolescent psychology. The concluding chapters of this thesis draw on the combined results from the two empirical studies contained within this thesis and explore what these mean for both ER theory and practice. As noted in the earlier chapters of this thesis, theoretical models and understandings of the process of ER suggest that ER may be susceptible to influences from factors within an individual's environment (Aldao, 2013; Gross, 2014; Marroquín, 2011). While these views have been prominent in the theoretical literature, there is a paucity of empirical research testing this assumption. The present research has addressed this by examining how if social support from three salient sources may interact with an adolescent's ER. Furthermore, the temporal ordering of ER and well-being and mental health in adolescents have also been addressed across the empirical components of this thesis.

The findings of this thesis have clear value, as the studies that have been undertaken here are both unique in their scope and design. The following chapters of this thesis now explore how the findings compare to the existing research base and accepted understandings of ER. They will further seek to explore what these studies' outcomes mean for the theoretical understanding of ER, and the application and dissemination of these findings to interventions and therapeutic approaches will also be discussed. This is a critically important aspect of the thesis, as the findings have the potential to support healthier psychological outcomes in young peoples' lives.

# Chapter 8 Contributions of the Thesis

## 8.1 Summary of the Scope of the Thesis

This thesis stands as a comprehensive examination of the process of emotion regulation (ER) and its relationship across time with adolescent well-being and mental health. Much has been made of the importance of effective ER in regard to adolescent psychological health (Steinberg, 2014). Indeed, ER has been described as being central to psychopathology and subsequently has garnered an enormous amount of research in the past two decades (Gross, 2013). Be that as it may, ER remains a process where much debate has surrounded many of the fundamental issues, such as true definitions and identifying appropriate measurement tools which reflect the construct (Compas et al., 2009; Gross, 2014; Koole, 2009; Tamir, 2011). These issues are acknowledged and addressed in the opening chapters of the thesis. This thesis has focused on aspects of the regulatory process, emphasising regulatory responses that are flexible, acceptance-based and goal focussed. Regulatory responses such as these closely reflect dimensions within the Psychological Flexibility Model, which have been shown to have many psychological health benefits for individuals (Hayes et al., 2012).

Chapter 5 consisted of an extensive systematic review of the current self-report measures of ER and their use in empirical studies involving adolescent populations. The comparison of current self-report ER measures led to the selection of a comprehensive and appropriate measure of ER. The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) assesses regulation dimensions congruent with the understanding and

definition of ER adopted by this thesis. Multiple recommendations emerged from the review process, related to the future selection and use of existing self-report measures. The assessment of previous empirical research revealed that the majority of these empirical studies were cross-sectional in design. Thus, while ER difficulties are thought to be central to psychopathology, the true nature and direction of this relationship in adolescents had yet to be adequately investigated. This finding arising from the review process directly supported the need for extensive longitudinal studies, so that the temporal ordering of ER and mental health could be investigated. The two empirical studies undertaken as part of this thesis set out to address the major empirical gap in our knowledge related to the temporal ordering of ER and adolescent mental health. The broader contributions and implications of both these empirical studies are expanded on in the following sections.

Taken in combination, both the previous theoretical and empirical works related to the process of ER contain some basic assumptions. The primary one is that ER is central to psychopathology (Gross, 1998; Gross & Levenson, 1997). The specifics of that assumption, such as which dimensions of ER are the most important, and the precise nature of the relationship that they share with adolescent mental health across time, were pursued within this thesis. The regulation of emotions perceived as being negative are those generally most associated with psychopathology (Bloch et al., 2010; Kring & Sloan, 2010). As a result, the selection of a self-report measure which assessed a comprehensive range of regulatory responses to upsetting emotions was made. Secondly, the most prominent theoretical model underlying ER reveals that the process of ER is a multi-stage process (Gross & Thompson, 2007). The ability to regulate one's emotions as a response to a negative emotion appeared to be the stage considered most highly associated with psychopathology (Gross, 2007, Nolen-Hoeksema, 2012). As a result, this thesis set out to

assess how responding to negative emotions using flexible style dimensions of ER are related to adolescents' mental health over time.

## 8.2 Summary of Thesis Contribution

The concluding chapters of this thesis cover two broad areas. The first of these clarifies the substantial contributions made by this thesis. The outcomes of each of the three major pieces of work within this thesis are contrasted with previous work, and their unique contribution to the field is emphasised. What the cumulative thesis findings mean for ER research and psychological practice is discussed. This will be especially the case for the consideration of how flexible-based regulation strategies may be applied in adolescent populations. Secondly, the limitations of the thesis as a whole are discussed. Suggestions for future research and theoretical considerations are then addressed.

The introductory chapters of this thesis discussed the complexities and measurement issues associated with assessing a multi-stage construct. It was decided that this thesis would target regulatory dimensions that were reflective of flexible, acceptance, and goal focussed style regulatory responses. This was consistent with the definition of ER adopted in this thesis and outlined by Gratz and Roemer (2004): it entails (a) awareness and understanding of emotions, (b) acceptance of emotions, (c) ability to control impulsive behaviours and behave in accordance with desired goals when experiencing negative emotions, and (d) the ability to use situationally appropriate ER strategies flexibly to modulate emotional responses as desired, in order to meet goals and situational demands.

The systematic review of the available self-report measures of ER and their application in the empirical literature (Chapter 5) was considered essential, both for the undertaking of this thesis and for the field. This undertaking helped to select a comprehensive measure of ER and to assess the strengths and limitations of all of the previous empirical research. The undertaking of the systematic review ensured that this

thesis and its empirical studies were informed by a foundation broad in scope. Prior to the completion of this review, only Phillips and Power (2007) had attempted to identify and contrast some of the more prominent adolescent self-report ER measures. The introductory chapters and the systematic review process helped to reconcile the different measurement and theoretical approaches to ER. Specifically, completion of the review helped to distinguish between the individual regulation measures and their suitability for future ER research.

Empirical Study 1, addressed the gaps in the literature, and in particular the failure by much of the previous research to thoroughly investigate whether difficulties regulating emotion presented as a risk factor for adolescent well-being and mental health. The use of a comprehensive and appropriate self-report measure of ER helped ensure a broad investigation. The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) was administered to a large population of adolescents across two time points. The primary purpose was to test for antecedent, reciprocal, or consequential relationships across time. Secondary aims involved the testing for any possible sex differences in ER which may be responsible for differences in mental health or well-being. The findings did not identify that difficulty in regulating emotion was a unique risk factor for poor adolescent well-being or mental health. Rather, the results highlighted that the majority of ER dimensions are reciprocally related to all three aspects of well-being (psychological, social, and emotional) and mental health in adolescents. Further analysis testing for the existence of sex differences, recorded no significant sex differences in ER as being responsible for any reported differences in the outcome measures.

Empirical Study 1 served to clarify the nature of the relationship between ER, mental health and well-being in early adolescence. It also established that ER is significantly related to adolescent psychological functioning, and that the nature of the

relationship between ER and well-being and mental health, across a 12-month period, was reciprocal. It also highlighted a number of regulation dimensions as being more important than others across that 12-month time period.

The most important of the assessed regulation dimensions was found to be an adolescent's ability to engage in goal-directed behaviour during negative emotions. The ability to work towards goals during times of negative emotion was identified as being the most important dimension of ER for adolescent mental health. These findings can be interpreted as sharing parallels with the values dimension of the Psychological Flexibility Model and with the therapeutic approach of Acceptance and Commitment Therapy that emphasises goal and value related behaviour (Hayes et al., 2012). These findings from Empirical Study 1 suggest that it is beneficial for adolescents to remain mindful of their goals and values during times of distress (Hayes et al., 2012). The observed reciprocal relationships also suggest that perhaps some forms of ER may serve to support an ongoing or cascading benefit over time. Through the completion of Empirical Study 1, a new insight into ER and mental health and well-being in adolescence was reached. This was achieved by utilising a comprehensive measurement tool, a large sample size with a longitudinal design, and using robust analysis to determine the nature of the relationship.

Empirical Study 2 sought to expand on the objectives of Empirical Study 1 by exploring how social factors may influence or support the process of ER. This was done by testing the Direct Effect Model of social support on ER and mental health, while also investigating an alternative mediation model which hypothesised ER as a mediator of social support and mental health. The decision to assess how perceived social support from important individuals within an adolescent's life, may affect their ability to regulate their emotions, was a direct response to recommendations made by prominent ER researchers (Aldao, 2013; Gross, 2014; Fosco & Grych, 2012; Marroquín, 2011). The need to include

salient factors from the adolescent social context into ER research and analysis has therefore been deemed imperative. It was decided that the inclusion of social support would be an appropriate social factor to include in Empirical Study 2. A further aim of this study was to determine if specific sources of support (parents, teachers, and close friends) could be identified as being the most important for an adolescent's ER and mental health. By utilising a 3-year longitudinal design, Empirical Study 2 forms one of the most comprehensive investigations of ER in mid-adolescence to date. Results confirmed parental and to a lesser degree teacher social support as being the most important for an adolescent's mental health over a three-year period. In comparison, close friend support was not found to have any significant effects on adolescent mental health or ER. Interestingly, from a theoretical standpoint, no source of social support was found to impact on an adolescent's ability to regulate their emotions. This suggests that perceived social support does not present as a significant social factor which influences the process of ER in adolescents.

Consistent with Empirical Study 1, most dimensions of ER (with the exception of lack of awareness of emotions) were found to share strong significant reciprocal relationships with adolescent mental health. This relationship was consistent across all three years. Finally, no mediation between any of the latent variables was identified. As adolescence is a well-documented time of turbulence, and growing independence, exploration of these factors simultaneously across three years has resulted in a major insight for the field of adolescent psychology. The implications of this research for being employed in psychological interventions and treatment in the future are especially important, and are explored in full in the following chapters.

## 8.3 Contribution of the Systematic Review

A comprehensive investigation of the self-report measures of ER previously utilised in adolescent populations was the primary goal of the systematic review in Chapter 5, which compared measures and summarised the associated empirical findings derived from their use (Appendix M). The findings of the review confirmed that the previously discussed ambiguity surrounding the ER construct was also present in the reviewed self-report measures. Many of the measures had similarly named subscales which contained items assessing the process of regulation at differing stages. Further examination of items revealed some measures were more reflective of affect measures rather than of the process of ER or only sampled a limited range of strategies.

The findings from the systematic review fell into two broad categories. The first centred on the self-report measurement tools currently used for assessing ER in adolescence. The second focussed on the methodological issues within the existing empirical research in which these measures have been employed. The results from the systematic review process resulted in valuable insights which were used to inform the empirical components of this thesis. The implications arising from the completion of the review directly informed the measurement selection and methodology in this thesis.

The essential task of defining ER is a challenging one. This is largely due to the process of ER being considered a multi-faceted and multi-stage process (Gross & Thompson, 2007; Kappas, 2011). This understandably creates issues for measurement construction, valid measurement of ER and the subsequent interpretation of research results. Aside from this, assessing ER in adolescence creates its own unique areas of concern. The emotion experience in adolescence has been recorded as being more intense and stronger than in other developmental periods (Ciarrochi, Leeson, & Heaven, 2009; Gilbert, 2012; Keyes, 2006; Steinberg, 2014). It also marks a time when adolescent's

regulation repertoires are broadening (Steinberg, 2014). Therefore, the systematic review process contributed to the selection of a comprehensive self-report tool, validated and suited to measure ER in adolescent samples. The completion of the systematic review therefore stands as a comprehensive reference which can be used to understand how the construct of ER has been operationalised in measurement construction and how these measures have been previously applied in adolescent populations.

**Lack of Developmental Specific Measures**

The research literature is clear that adolescence is a stage which is considered a unique developmental period (Steinberg, 2014). Unfortunately, researchers who wish to examine the process of ER in adolescent populations will find a paucity of measures that are designed to be adolescent specific. The systematic review process found that the majority of available self-report measures were not initially designed for use in adolescent populations; rather, they were adapted after first being used in adult or child populations. This is a critical finding, particularly in recent times, as it has become increasingly clear that the adolescent emotional experience, and related brain development, are distinct from other stages of development (Compas et al., 2009; Dahl, 2004; Steinberg, 2010; Steinberg, 2014). However, specific consideration of this fact, where the unique emotion experience for adolescents would be reflected in the items or subscales of the assessed self-report ER measures, was not observed. It was recorded that of the existing measures, only the Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) was available in a modified child-adolescent version (ERQ-CA; Gross & John, 2003). Even so, as noted in the review chapter, the ERQ-CA (Gross & John, 2003) only assesses two ER strategies (cognitive reappraisal and expression suppression), and so is far from being able to be considered a comprehensive measure of ER. This is problematic when seeking to assess the true scope of ER, as individuals utilise a range of possible regulation strategies on a

daily basis (Gross, 2014; Lougheed & Hollenstein, 2012). Assessing only two strategies therefore, fails to capture the true scope of the developing regulation capacity that adolescents possess. Similar issues were also present within the Emotion Expression Scale for Children (EESC: Penza-Clyve & Zeman, 2002) and the Children's Sadness Management Scale (CSMA: Zeman, Shipman, & Penza-Clyve, 2001).

As well as acknowledging the unique aspects of the developmental period of adolescence, perhaps contextualised ER measures may further help our understanding of the situational use of ER in an adolescent's life. For instance, how a young person chooses to regulate their emotions around their peers may not be the same when they are around family members, who may be perceived as being more supportive and less judgemental. A contextualised self-report ER measure for adolescents could utilise items with a specific frame of reference. For example, "I suppress my negative emotions around my *friends*", compared with "I suppress my negative emotions around my *family*". This approach would recognise the situational use of regulation strategies, depending on the context made apparent in the item. By developing measures which capture the situational use of ER we could learn more about the process of ER in adolescence than the present global self-report measures allow us to.

The current thesis aimed to make a comprehensive examination of how regulatory responses, with a focus on flexible-based regulation strategies, were realted to adolescent mental health. As a result, the ERQ-CA (Gross & John, 2003), EESC (Penza-Clyve & Zeman, 2002) and the CSMA (Zeman, Shipman, & Penza-Clyve, 2001) were not deemed suitable for the empirical components of this thesis. Instead, the DERS (Gratz & Roemer, 2004), which had not been specifically designed for adolescents, but which had been used and validated in adolescent populations (Neumann et al., 2010), presented as the most appropriate of the existing measures. While the other self-report measures assessed had

also received validation in adolescent samples, the DERS was deemed, after careful consideration, the most appropriate of the currently available measures. In the future it would be encouraging to see development and emphasis both on developmentally-specific and contextualised measures for adolescent populations.

**Stages of Regulation Measured**

The introductory chapters of this thesis explored the Process Model which served to illustrate that the process of ER may be employed and measured at various stages of the emotion cycle (Gross & Thompson, 2007). Examination of the item construction of the self-report measures in the systematic review revealed a strong bias toward assessing ER at the response stage of the regulation process. As noted, this is perhaps because regulation as a response is often thought to be most strongly associated with psychopathology (Gross, 2007; Nolen-Hoeksema, 2012). The review process served to confirm this bias. A lack of measures or subscales that assess ER at the antecedent stages of regulation was confirmed. As mentioned, the ERQ-CA (Gross & John, 2003) appears to be the only available self-report measure which offers the option of explicitly assessing an antecedent-based regulation strategy (cognitive reappraisal of the situation). This finding suggests a chronic under-sampling of possible antecedent-based regulation strategies in the self-report category of measurement. By only focussing predominantly on the response-style dimensions of regulation, important future comparisons which investigate the complexity of the regulation process, cannot be made.

The consideration of measurement development is an area for those who drive the future development of self-report ER measures to address. Careful item and scale construction that is representative of the specific stages of regulation is essential. This must also include the strategy of ER being assessed as being one that is clearly identified as an antecedent or response to a negative emotion event. These issues should be considered

paramount if ER self-report measures are to improve into the future. In the meantime, there is potential for measurement issues to be managed through the use of other forms of ER measurement. These may include those that did not fall into the criteria for inclusion within the systematic review. Indeed, alternative measurement options do exist that assess earlier antecedent stages of regulation; these may also be suitable for use in adolescent populations if validation studies prove successful (see Fairholme, Boisseau, Ellard, Ehrenreich, & Barlow, 2010 for a comprehensive list of alternative measures). Promising comprehensive multi-stage self-report measures that have been used in adult samples could also be considered for use with adolescents in the future. Schutte et al. (2009) created a 28-item measure that assesses regulation across all of the stages of the Process Model. This self-report measure successfully allowed for comparisons between antecedent and response strategies in a sample of adults.

The need for additional self-report measures suitable for adolescent populations which assess more antecedent-based ER strategies is however, great. Addressing this issue will allow for insightful comparisons to be drawn, and rigorous testing of whether regulation throughout the various stages may prove more effective. Exploring these comparisons comprehensively can only be made possible through the future development and application of measures which reflect the multi-stage process of ER.

**The Systematic Review as a Resource for Future Empirical Research**

The systematic review served to bring together and contrast methodological designs of 50 empirical studies in which the identified measures had been applied (Appendix M). Its use as a resource for those in the ER research field should not be understated. It forms a comprehensive resource which allows for comparisons between the essential details and findings of each specific study in which these measures have been applied. Consequently, the identified lack of longitudinal studies with adolescent samples, is a standout point that

like this thesis, future research must aim to address. Only 9 of the 50 identified studies used a longitudinal design and, as highlighted, many faults surrounding measurement use, population issues, and outcomes were evident. Both of the completed empirical studies undertaken in this thesis were larger in scope than any found within the existing research-base (Appendix M). A continual effort aimed at rectifying the existing imbalance of studies by making a concerted effort to undertake more research with longitudinal designs, should be a priority for the field. The replication of findings from multiple longitudinal studies which use the same measures should also be aspired to. This will help consolidate the field of ER research and allow more confidence in the inferences one makes on the nature of the relationships between ER and psychological states in adolescence. Only through this continual process can relationships between ER and psychological health in adolescence be established with certainty.

In summary, the systematic review process served to inform and guide the undertaking of the two major empirical studies contained within this thesis. It ensured that both of these studies utilised a comprehensive measure and addressed a major gap in the literature. As a result, the empirical components of this thesis utilised a comprehensive self-report ER measure, deployed in a large population of adolescents and using a longitudinal design that allowed for robust and powerful statistical methods to investigate the temporal ordering of ER and mental health. The systematic review's broad contributions to the field included bringing an awareness of the needs and oversights surrounding the study, and measurement of the popular construct of ER in adolescent populations. It has illustrated the need for future comprehensive longitudinal designs to further clarify the relationship between ER and mental health. The recommendations arising from the systematic review process should help contribute to the overall standards and goals of future research focussing on the construct of ER in adolescent populations.

## 8.4 Empirical Contributions

Emotion regulation (ER) theorists have long argued that difficulties in regulating one's emotions over a period of time can result in psychopathology (Gross, 2014; Gross & Thompson, 2007; Linehan, 1993a; Nolen-Hoeksema, 2012). As a result, ER has been described as being both central to psychopathology and one of life's greatest challenges (Gross, 2002; Gross & Thompson, 2007; Eisenberg et al., 2004). On this basis, its popularity as a research construct seems justified, although the nature of its relationship with overall adolescent mental health, at least prior to this thesis, appears both unclear and understudied (Neumann et al., 2011). As highlighted within the systematic review, the majority of previous empirical findings which have supported ER as being related to adolescent mental health and behaviour, were derived from studies utilising cross-sectional designs (Eisenberg et al., 2001; Frick & Morris, 2004; Garber, Braafladt, & Weiss, 1995; Gratz & Roemer, 2004; Morrongiello, Kane, McArthur, & Bell, 2012; Silk, Steinberg, & Morris, 2003; Suveg, Hoffman, Zeman, & Thomassin, 2009). This strong emphasis on results drawn from cross-sectional designs makes definitive conclusions on whether ER difficulties result in mental health issues in adolescent populations questionable.

The rise of ER's popularity which has contributed to a broader understanding of the process of ER, has contributed to what has been described in the research literature as an affect revolution (Adrian et al., 2011; Tangney & Fischer, 1995). The identification of a broad array of potential regulation strategies, and the understanding that these may be employed at various stages of the emotion cycle, are some of the more salient points emphasised in this thesis (Aldao, 2010; Gross, 2014; Gross & Thompson, 2007). These issues must be given due consideration by other researchers when undertaking and reporting their research findings on the construct of ER.

Similarities between ER and related constructs, such as psychological flexibility, have also come to be recognised within the field of regulation based research (Gratz & Roemer, 2004; Hayes et al., 2012; Kring & Sloan, 2010; Williams et al., 2012). These similarities have extended to comparisons between well-established strategies, such as suppression, with conceptually similar strategies, like experiential avoidance (Nolen-Hoeksema, 2012). This thesis investigated regulatory responses reflective of those which help form the Psychological Flexibility Model and related therapeutic approaches that emphasise acceptance and awareness of emotions (eg., Linehan, 1995$_{a)}$.

The primary empirical goals laid out in this thesis were to investigate the relationships between mental health and multiple dimensions of ER. Another aim was to investigate whether ER existed as a mechanism between social support and mental health, or whether social support and ER both exerted their own direct effects on mental health. The ER dimensions assessed were consistent with acceptance, flexibility, and awareness-based responses to negative emotions (Gratz & Roemer, 2004). The use of rigorous statistical methods and a longitudinal design, allowed this thesis to establish temporal ordering between ER, well-being, and mental health. The two empirical studies contained within this thesis therefore, represent a comprehensive investigation of how multiple dimensions of ER is related to well-being and mental health in adolescent populations. The findings also help isolate those specific dimensions of ER that are most important across time.

As discussed in the introductory stages of this thesis, comparing research findings focussed on ER can prove problematic, and discrepancies between empirical findings may be attributed to a number of issues related more broadly to the field of ER research itself. This problem is emphasised in consideration of the limited number of studies that utilised similar self-report measures in adolescent populations (see Chapter 5 and Appendix M).

This is also especially the case where measures assess dimensions or strategies of regulation with similar names. The heterogeneity of definitions concerning ER and how they have been operationalised as recently noted by Aldao et al. (2015) has proven a challenge when attempting to synthesise findings across a number of studies for purposes such as meta-analysis.

Until the completion of this thesis, the DERS (Gratz & Roemer, 2004) had never before been used in an adolescent population longitudinally. This makes direct comparisons with other empirical studies in adolescent populations somewhat difficult. These difficulties associated with contrasting the thesis findings with the existing research base must be acknowledged from the outset. That said, the systematic review in Chapter 5 identified a limited number of multi-time point longitudinal studies that had previously used other self-report ER measures. The findings from these longitudinal designs were presented in further detail in the introductions of the empirical studies within this thesis. While these previous studies were generally of a lesser magnitude than those undertaken in this thesis, the following section will seek to compare the thesis findings with those of the previous work. Special attention will be given to examining the nature of the relationships between ER and psychological measures in these studies. Specifically, the comparisons will aim to investigate whether evidence for a reciprocal relationship across time, such as that found in this thesis, is present in other findings. This process is also expected to further highlight the unique contribution that this thesis has made. It also allows for an informed discussion to then follow, regarding the dissemination of the findings from this thesis in the field.

**A Contrast of the Thesis Findings with Previous Longitudinal Research**

Larsen and colleagues (2013) looked at the longitudinal linkages between ER and depression over two years. A sample of 1,753 Dutch adolescents (mean age = 13.8 years)

was used as part of their study. They tested for the effects of expressive suppression (response-focussed strategy) and its proposed relationship with depressive symptoms. Structural equation modelling was undertaken, with a statistical design comparable to that used in the first empirical study of this thesis (i.e., 2-timepoint SEM). The analysis undertaken by Larsen et al. (2013) revealed strong support for depressive symptoms preceding the increased use of expressive suppression, whereas expressive suppression did not significantly predict depressive symptoms one year later. Unlike the robust reciprocal relationships found in this thesis, Larsen et al's. (2013) study found a clear and significant unidirectional relationship: higher depressive symptoms resulted in significantly higher expressive suppression one year later in Dutch adolescents. Finding expressive suppression not to be a significant predictor, but rather a consequence of depression, was an intriguing finding. The current thesis found non-acceptance of negative emotions, a strategy conceptually related to suppression, to have a strong reciprocal relationship with poorer mental health and well-being across two time points (see Empirical Study 1). A similar relationship between the latent variables of expressive suppression and depression was not observed in Larsen and colleagues' (2013) study. A possible reason for this inconsistency may be that Larsen et al. (2013) used a self-report measure which specifically targeted depression, while the current thesis used the General Health Questionnaire-12 (GHQ-12; Goldberg & Williams, 1988). The GHQ-12 is a broader measure designed to assess overall mental health. Whilst correlating with measures of depression (Tait et al., 2002), it may be that expressive suppression as a behavioural ER strategy is more strongly related to depressive-style symptoms. That could help to explain why a similar relationship was not found with the broader measure of mental health and many of the ER dimensions assessed in this thesis.

Until the completion of Empirical Study 2, a further study by Larsen and colleagues (2012) was perhaps the most comprehensive investigation that had been undertaken previously involving adolescents. Larsen et al. (2012) again chose to examine just one ER strategy (expressive suppression), but this time they included the factors of parental social support and peer victimisation. They also utilised three waves of data from a large sample of non-clinical adolescents. While the sample size and design were notable strengths, the 2012 study disappointingly chose to examine only one source of social support and one ER strategy. The variables of parental support and peer victimisation were both investigated as potential mediators which may link expressive suppression and depression. This study has some similarities to that of Empirical Study 2, which also tested for mediating relationships. The analysis consisted of structural equation modelling, with all relevant linkages tested. Larsen et al. (2012) found reciprocal relationships between depressive symptoms and parental support. This was in contrast to Empirical Study 2, that found parental support to predict mental health directly, but not reciprocally. Larsen et al. (2012) also reported no strong relationship between parental support and ER. This finding is consistent with Empirical Study 2, that only showed parental social support as being strongly related to mental health rather than to ER difficulties.

Comparison between both longitudinal studies: Larsen et al. (2012, 2013) reveals robust support for a unidirectional relationship existing between depressive symptoms and poorer ER (expressive suppression) in adolescents. This suggests good stability for this finding across both of their studies. Again, this is interesting, as the current thesis findings show that all ER dimensions (with the exception of awareness) share a strong, significant reciprocal relationship across time with mental health and well-being. Differences in scope between Empirical Study 2 and Larsen et al's (2012) study of social support and its role in adolescent ER and depression, are also noted. Unlike Empirical Study 2, Larsen et al.

(2012) did not measure the role of peer or teacher support (in conjunction with parental social support) so comparisons cannot be drawn. This limitation was addressed by this thesis in Empirical Study 2. Subsequently, the thesis findings found no support for close friend support as being related to an adolescent's mental health across time. Rather parental and teacher social support were the most significantly important sources for young peoples' mental health over a three-year period.

A further longitudinal study that used a sample of 1,065 adolescents was undertaken by McLaughlin et al. (2011). Although this was one of the smaller recorded longitudinal designs, both in sample size ($N$ = 1,065) and duration (seven months), it still provides insights into the longitudinal linkages between ER and psychological health in adolescents. McLaughlin et al. (2011) formed a unitary latent variable of emotion dysregulation. This was formed with the factors emotional understanding, dysregulated expression of sadness and anger, and ruminative responses to distress. Their analysis revealed that emotion dysregulation predicted changes in anxiety, aggressive behaviour, and eating pathology. This is unlike Larsen's (2012; 2013) two studies, where the ER strategy of expressive suppression failed to directly predict depression. McLaughlin et al. (2011) also reported that psychological symptoms did not predict emotion dysregulation seven months later. On the basis of their findings, the authors concluded that emotion dysregulation presented as a significant risk factor for adolescent psychopathology. This finding of emotion dysregulation presenting as a risk factor was not supported by the current thesis. The empirical components of this thesis both recorded significant reciprocal relationships between ER difficulties and mental health and well-being (Empirical Study 1) and mental health (Empirical Study 2).

It should be noted that Larsen et al. (2012; 2013) and McLaughlin et al. (2011) both measured ER with different measures. McLaughlin et al. (2011) also included rumination

responses to distress as part of their emotion dysregulation latent variable. As a result, this latent variable may have been partly confounded with an outcome measure, and not appropriately reflecting the process of ER. Both Larsen et al. (2012; 2013) and McLaughlin et al. (2011) assessed psychopathology symptoms, but with different measures; this also complicates possible further comparisons.

This variability in measurement tools and time between the studies serves to illustrate the difficulties of drawing meaningful comparisons. As noted in the introductory chapters, while broadly reviewing the methodological and measurement issues associated with ER research, a range of different ER measures may focus on different stages of the regulation process. The assessed strategies may also be investigated in research designs which incorporate varied outcome measures. This issue may be helping to contribute to what may be perceived as inconsistencies between the few longitudinal research results that the field currently has produced. The replication of research results with the same measures may help to alleviate such discrepancies into the future. These comparisons between studies further highlight the challenges and complexities of ER research into the overlooked developmental period of adolescence.

## 8.5 Emotion Regulation as Mediator

In recent times more emphasis on understanding how the process of emotion regulation (ER) may be influenced by a range of extrinsic factors, interactions, and influences has grown (Aldao, 2013; Gross, 2013; Lakey & Cohen, 2000). This thesis has recognised that the regulatory process does not solely occur in isolation and subsequently included social factors into its empirical investigations that have often been overlooked by the research literature (Fosco & Grych, 2012). Empirical Study 2 incorporated the salient factor of social support and examined its effects in conjunction with ER and adolescent mental health. The three wave design utilised in Empirical Study 2 allowed for the

appropriate investigation and statistical testing as to whether a mediating relationship existed. This was vitally important as many mediated relationships that are often thought to occur over time, are often wrongly tested in cross-sectional designs (Field, 2009). The 3-wave longitudinal design employed in Empirical Study 2 allowed for all longitudinal linkages to be tested (see Supplementary Material F). This allowed for the testing of the direct and mediating models in respect of the hypothesised relationships.

The specific aim therefore was to ascertain if social support leads to the development of better regulation and whether better regulation, in turn, leads to improved mental health in adolescents. Or conversely, to examine whether social support and ER both had unique effects on adolescent mental health over time. This latter perspective was largely informed by many of the assumptions that are inherent in the ER literature of the past.

Prior to Empirical Study 2, the mediation research, that had focussed on the process of ER in adolescents, had delivered mixed findings. Some empirical support for ER as a mediator had been found, although testing in adolescent populations had not been extensive (McLaughlin, Hatzenbuehler, & Hilt, 2009; Yap, Schwartz, Byrne, Simmons, & Allen, 2010). Larsen et al. (2012) had previously argued that parental social support could act as a mediator between ER and depressive symptoms. Results for that contention proved mixed, and support was found for this only in girls and not in boys. Decreased parental social support was confirmed as an intervening variable between depressive symptoms and expressive suppression. McLaughlin et al. (2009) also found evidence for mediation in an adolescent sample, but with increases in emotion dysregulation mediating the relationship between relational and reputational victimization and changes in internalizing symptoms. A recent study by Mills, Newman, Cossar, and Murray (2015) has demonstrated that ER mediates the relationship between childhood abuse and disordered eating. These findings

indicate how being able to regulate one's emotions can under some circumstances prove to be a significant mechanism serving to mediate a variety of psychological disorders and relationships in young people's lives.

Empirical evidence for the role of ER as a mediating factor is consistent with theory that suggests ER is shaped by experiences such as social learning and parental practices (Steinberg, 2014; Steinberg, Myers, & Robinson, 2007). These considerations all served to inform the basis for undertaking an investigation into whether ER could mediate perceived social support and adolescent mental health, in Empirical Study 2 of this thesis. The three time point longitudinal design allowed for the specific testing of a mediation hypothesis, as proposed by Marroquín (2011), compared with the well-established Model of Direct Effects which has long driven approaches to understanding social supports relationship with mental health (Lakey & Cohen, 2000; Wills, 1985). Structural equation modelling across 3-waves of data was undertaken in Empirical Study 2. Latent variables included three forms of social support (close friend, teacher, and parent), six dimensions of ER, and mental health. After extensive testing, as reported in Empirical Study 2, no evidence was found for any form of mediation. Rather, the findings supported the Direct Effects Model of social support. This means that higher levels of perceived social support significantly predict better mental health in adolescents. However, not all sources of social support were found to have beneficial significant effects for adolescent mental health. The importance of social support was only confirmed as being present when coming from parental and to a lesser extent teacher social support. Surprisingly, social support from close friends was not found to have any significant effects on an adolescent's mental health or regulation.

In this thesis, when reviewed under the adopted strict reporting criteria, the significant direct effects of social support were isolated to their effect solely on adolescent

mental health. Evidence was not found as to whether supportive behaviours may underlie an adolescent's ability to regulate their emotions. One must be tentative in drawing conclusions from this study in regard to the effects that social factors as a whole may have on ER. The effects of contextual or social forces on the regulation process should be considered a complex and broad area of investigation (Fosco & Grych, 2012; Gross, 2014). Nonetheless, in this thesis perceived social support was not found to influence any of the six assessed dimensions of ER in adolescents. Conclusions which suggest that parents, teachers, and close friends hold no influence over any type of adolescent ER should again be made with caution. Perhaps socialisation factors such as parenting styles, and modelling parents' emotions, are more important for an adolescent's own ER than perceived levels of social support (Morris, Silk, Steinberg, Myers, & Robinson, 2007). The interaction between social and intrinsic factors associated with the process of ER is unlikely to be clear cut (Fosco & Grych, 2012). This consideration should be at the forefront of any future research efforts when considering ER's role as a potential mediator.

Based on the findings derived from the empirical studies in this thesis a number of implications for the field can be drawn. These implications are discussed at length in the following chapter. The results from the empirical studies of this thesis though have led to some broad findings. For example, multiple dimensions of ER share strong reciprocal relationships with adolescent well-being and mental health. Also, rather than influencing an adolescent's ability to regulate negative emotions, parental, and teacher social support exert significant direct effects on an adolescent's mental health. The clinical implications that arise from the findings of both empirical studies are significant, especially in relation to treating young people in clinical settings. Encouraging parental social support, in conjunction with teaching adolescent's better ways of regulating their emotions, may prove a viable two pronged treatment approach for improving adolescent mental health.

# Chapter 9 Implications

## 9.1 An Outline of Implications

The cumulative findings of this thesis have implications both for psychological treatment and for psychological interventions within adolescent populations. The most salient of these findings are again summarised here, before each of the most pertinent implications arising from them are discussed. Multiple dimensions of emotion regulation (ER) were found to share significant reciprocal relationships with mental health and well-being in adolescents, across both empirical studies. This relationship was observed both across two time points (Empirical Study 1) and three time points (Empirical Study 2). The dimensions which were highlighted as being the most important included being able to have access to strategies, and goal-focussed behaviour during times of negative emotion. The nature of the observed reciprocal relationships would seem to suggest that ER difficulties do not in themselves present as a unique risk factor. Rather, they share an ongoing reciprocal relationship with mental health, which suggests that over time, good regulation occurs in conjunction with better well-being and mental health.

Social support from parents, teachers or close friends was found not to impact on an adolescent's ability to regulate their emotions. Instead, increased parental and teacher social support led to significantly better mental health outcomes. While both social support and ER are related to adolescent mental health, there was no observed relationship between perceived social support and ER. This finding suggests that social support (parental and teacher) and ER both have their own, independent effects with and consequences for adolescents' mental health.

The following section will explore the implications of the empirical findings from this thesis and how they should be best applied within the field of psychology.

Consideration will be given toward how the dissemination of these findings can be achieved for those working with young people. Therapeutic approaches which are closely aligned with the dimensions of ER investigated by this thesis are explored as a means of facilitating this. Suggestions are also made for future theoretical understandings regarding the process of ER. Furthermore, based on the findings from this thesis there remains the future potential to design, deliver, and evaluate an intervention that targets both social support levels and ER skills in young people. It is hoped that the work and subsequent findings made by this thesis will serve as an impetus for that.

## 9.2 Clinical Applications and Psychological Treatment

A future challenge for clinicians will be how to best incorporate and deliver the benefits of empirically supported ER strategies into both existing and new therapeutic approaches (Mennin & Fresco, 2014). This seems essential for the full potential of regulation based research to be attained and recognised. It will also help to support the development of healthy psychological functioning in young people. The findings from this thesis point toward the importance of emphasising both flexible access to a range of strategies and goal-focussed approaches when regulating negative emotions. Delivering psychological treatments through therapeutic approaches that are congruent with the findings of this thesis will now be canvassed.

Psychological flexibility is understood as the ability to be in full contact with the present moment and the thoughts and feelings it may contain without needless defence, and, depending on what the situation affords, persisting in or changing behaviour in the pursuit of one's goals and values (Hayes et al., 2012). The Psychological Flexibility Model underlies the therapeutic approach of Acceptance and Commitment Therapy (ACT). As explained in the introductory chapters, psychological flexibility also shares much similarity with the dimensions of regulation that were assessed within this thesis. The specific

dimensions of regulation that allowed for goal-directed behaviour was found to have the strongest empirical support when compared with other dimensions in Empirical Study 1. While ACT makes distinctions between values and goals, the behaviour of focussing on meaningful goals during times of negative emotions seems a novel one to the field of ER.

The ACT Model is not the only approach which emphasises flexible goal focussed behaviour. It also has similarities with related approaches to dealing with distressing thoughts and emotions. These include Dialectical Behaviour Therapy (DBT; Linehan 1993a, 1993b), and Mindfulness-Based Teachings (MBT; Kabat-Zinn, 1982; Kabat-Zinn, 1990). Each of these shares a consistent theme, aimed at encouraging individuals to make room for psychological difficulties rather than simply trying to suppress or ignore one's feelings (Hayes et al., 2012). The implications of the empirical findings of this thesis would suggest that the central tenets of these therapeutic approaches could be most helpful if applied specifically to helping young people learn how to regulate their difficult emotions through goal directed behaviour.

Recently, researchers and practitioners have been working in conjunction to take related findings from ACT and positive psychology to directly help adolescents manage their emotions (Hayes & Ciarrochi, 2015). The Discoverer, Noticer, Advisor, Value model (DNA-V model; Hayes & Ciarrochi, 2015) has been proposed as a means for helping adolescents deal with their emotions and thrive. This adolescent targeted approach makes use of exercises and metaphors that are aimed at encouraging adolescents to notice, normalise, and allow their negative emotions (Hayes & Ciarrochi, 2015). This approach is consistent with teaching adolescents to be conscious of their regulatory responses to a negative emotion or thought. It encourages adolescents to move beyond using strategies aimed at suppressing or modulating their emotions such as avoidance or suppression (Hayes & Ciarrochi, 2015). By encouraging adolescents to explore how they respond to

their negative emotions and be mindful of their values, the hope is that adolescents may learn to notice their emotions and be adequately prepared for the onset of future negative emotions. As a result, this approach will allow them to be better prepared to respond flexibly and use regulatory strategies that are most effective for dealing with their negative emotions. The DNA-V model presents as a new but promising integrative approach for practitioners who may wish to introduce to adolescents a way of employing the strategies of ER that were identified in this thesis as being most important for mental health.

Integrating the effective use of ER strategies into psychological treatments may also benefit from a more applied approach. Mennin and Fresco (2014) have proposed Emotion Regulation Therapy (ERT), an ER-based model that they claim is always being continually developed and tested. This model may prove to be the vehicle for the applied application of what has been learned throughout the years, in the affect revolution (Adrian et al., 2011; Tangney & Fischer, 1995). Unlike other therapeutic approaches, ERT is explicitly informed by empirical findings from affect-based research. Although only at the early stages of development, it would seem that ERT's current focus is consistent with the findings of this thesis, that emphasise ER's importance for ongoing mental health in adolescents.

The mechanisms of ERT include motivation, regulation, and contextual learning. Each of these mechanisms is targeted through its own therapeutic process. Motivation is targeted through the use of awareness skills training. The findings from this thesis did not find support for the awareness of negative emotions as significantly predicting measures of mental health or well-being (see Empirical Studies 1 and 2). However, the awareness of motivations in ERT emphasises specifically the focus on being able to have clarity of emotions, for which this thesis did find significant reciprocal support across time. Individuals undertaking ERT are also encouraged to engage in metaphors such as Catch

Yourself Reacting (CYR). Like the DNA-V model this also encourages noticing and exploring of negative emotions, the CYR type metaphors also encourage one to notice and feel the emotion. This can then help to identify and achieve clarity of the explicit issues associated with the feelings connected to the emotion and work toward goals (Mennin & Fresco, 2014).

Emotion Regulation Therapy (ERT) uses regulatory skills training to specifically target the mechanism of regulation. Utilising approaches that are informed by Cognitive Behavioural Therapy (CBT), and relying on an understanding of ER informed by the Process Model (Gross & Thompson, 2007), subsequently this training aims to build regulation skills across the multiple stages of regulation with strategies such as attending, allowing, distancing, and reframing. The importance of being flexible and having access to multiple strategies was strongly supported in both empirical components of this thesis. The having access to strategies subscale of the DERS (Gratz & Roemer, 2004) was consistently revealed to be one of the most critically important dimensions of regulation. Further training around flexible based regulation responses that also involve clarity, acceptance, and goal directed behaviour, as identified in this thesis, is a way that ERT could integrate the findings from this thesis into its regulation training.

Methods such as experiential exposure are also used in ERT, to target contextual learning. Exposing people to threat-reward scenarios is primarily achieved through identifying values and important goals which an individual may have. This aspect of ERT also shares strong similarities with the emphasis on values seen in ACT (Hayes et al., 2012) and the DNA-V model (Hayes & Ciarrochi, 2015). Again, an emphasis on goal directed behaviour was found to be empirically supported by this thesis and confirms the emphasis by these approaches of encouraging individuals to engage with things that are important to them. Indeed, in Empirical Study 1, goal-directed behaviour during negative

emotions was shown to be the most important dimensions of regulation, through the use of Exploratory Structural Equation Modelling (ESEM). This demonstrates that the regulatory dimension of goal-directed behaviour was the most reliable and significant predictor of well-being and mental health over two years in adolescence. Unfortunately, the nature of the specific goal could not be ascertained through the measurement method, but DNA-V, ERT and ACT both suggest that goals and values can differ between individuals (Hayes et al., 2012; Hayes & Ciarrochi, 2015; Mennin & Fresco, 2014). As a result, working with young people to firstly identify their goals and values, should feasibly help them learn about themselves and connect with the personal meaning of any regulatory skills training that is subsequently introduced.

The therapies and proposed treatment models that have been mentioned here share many common components. They all promote flexible regulation, awareness, and acceptance of emotions, as well as goal-focussed behaviour during times of difficult emotions. Emotion Regulation Therapy (ERT) and ACT in practice both do this by identifying an individual's goals and values, and teaching skills through various activities that can allow for appropriate responses in the face of uncomfortable thoughts or emotions (Hayes et al., 2012; Mennin & Fresco, 2014). This thesis has found strong support for the dimensions of ER which are central to these approaches. Adolescents who can engage in goal-directed behaviour and respond to their emotions while gaining access to appropriate strategies, are more likely to enjoy better mental health and well-being over time.

The implications from this thesis therefore serve to support the existing (eg., ACT) and newly developing therapeutic approaches (eg., ERT) which centre on dimensions of regulation that include flexible and goals-based strategies. Working with young people to help them identify their goals and to connect with what is most important in their own lives during times of negative emotions, seems essential for healthy functioning. Psychological

approaches such as the DNA-V model may help to facilitate this type of emotional awareness when treating adolescents (Hayes & Ciarrochi, 2015). The emphasis on promoting regulatory flexibility that involves access to ER strategies and engaging in goal-directed behaviours should be strongly incorporated into these existing approaches when working with young adolescents. It follows that these forms of regulatory responses could have positive benefits for broader adolescent populations if delivered in further formats such as preventative based psychological interventions. The following section will examine the existing preventative intervention landscape and consider how the thesis findings could be best employed.

## 9.3 Preventative Interventions

The importance that specific dimensions of ER hold for continued mental health in adolescence, as identified in this thesis, suggests that delivering preventative interventions that utilise them could prove productive. The process of ER has previously been suggested as an ideal aspect of psychological functioning to target through psychological intervention (Gross & Muñoz, 1995; Hessler & Katz, 2010). The undertaking of this thesis has served to highlight that the primary dimensions of ER that should be targeted must include helping young people to access regulatory strategies that work, whilst also engaging in goal-directed behaviour in response to negative emotions. This thesis has helped build our knowledge of the importance of these specific dimensions of ER by showing how they are related to adolescent mental health. As a result, the identification of regulation responses that present as promising candidates for intervention has been achieved. Targeting these dimensions of ER will help best ensure that the regulation processes most strongly related to adolescent mental health and well-being are the subject of future preventative based interventions.

A strong consensus in the ER literature suggests that certain regulation styles, if used continually and unsuccessfully, can predispose an individual to mental illness (Gross, 2014; Nolen-Hoeksema, 2012). This is critical from the perspective of adolescence, when it is considered that if ER difficulties develop and become ingrained early on, they may contribute to a trajectory of poorer mental health into adulthood (Costello et al., 2011). Adolescence is well documented as a developmental period considered to be especially tumultuous (Steinberg, 2014). The environment in which young people grow and function is complex, with a range of social demands and extrinsic influences coming from their social environments (Aldao, 2013). Designing interventions that identify, reinforce, and encourage the use of appropriate ER responses is therefore necessary but challenging for contemporary practitioners.

Unfortunately, there is a paucity of published psychological interventions dealing explicitly with teaching ER strategies in adolescent populations and evaluating their results. In response Broderick and Jennings (2012), have called for widespread mindfulness based training and interventions for all adolescents as they traverse the tumultuous period of adolescence. They believe that a mindfulness based approach is ideal for preventative based interventions aimed at helping adolescents with regulation of their difficult emotions. They outlined a proposed universal program for adolescents called Leaning to Breathe (L2B), which focuses on awareness and understanding of emotions from a mindfulness based approach (Broderick & Jennings, 2012). While they report no empirical findings on its effectiveness, it has been designed to be incorporated into normal secondary school curricula and could possibly be modified in the future, to incorporate more applied ER strategies, such as the ones this thesis has found as being the most important for adolescent's mental health.

Empirical support focussing on ER with psychological interventions in adults, has supported the assumption that targeting the process of ER can lead to improved therapy and treatment outcomes (Berking et al., 2008; Fresco, Mennin, Heimberg, & Ritter, 2013). In one of the few interventions that has involved adolescents, Horn, Pössel, and Hautzinger (2010) delivered a prevention based psychological intervention in a group of German youths. Compared to the control group, young people who engaged in expressive writing and psycho-education targeting ER, reported significantly better levels of negative affect and school-based outcomes. This study demonstrates that teaching young people effective ways to regulate their negative emotions can lead to positive psychological and social outcomes. Unfortunately, the therapeutic approaches congruent with the ER perspective of this thesis (e.g., ERT and ACT) have not published any preventative interventions which focus on delivering and evaluating these specific ER strategies in adolescent populations.

Related intervention research undertaken in child-based populations though has led to some promising results. Kovacs et al. (2006) carried out a pilot clinical trial delivering Cognitive Emotion Regulation Therapy (CERT) for depression in older children. This intervention program targeted a range of regulation strategies for use in targeting childhood depression. Assessment of the intervention was extensive, and involved questionnaires and clinical evaluations. On completion of the evaluations it was found that CERT resulted in significant declines in depressive symptoms. These benefits remained consistent at 6 and 12 month follow ups. Of particular interest for clinicians was the feedback that suggested that CERT was flexible enough to allow for the tailoring of treatment to children's specific regulatory needs (Kovacs et al., 2006). This could feasibly include the inclusion of ER strategies that allow for the identification of goals and identifying regulatory responses that could help support working toward these over time.

While the preventative intervention literature focussing on ER in adolescent populations is sparse, the potential based on these limited empirical outcomes with children and adults seems promising. Empirical evidence and clinical literature are in agreement that preventative interventions can have beneficial social and psychological effects (Magyar-Moe, 2009). It has been noted throughout this thesis that adolescence is a unique developmental period (Steinberg, 2014), so it is essential to undertake preventative based intervention research that involves the process of ER with adolescents in the future. It is hoped that an outcome arising from this thesis will be to inspire others to design, deliver, and evaluate ER-based psychological interventions within various adolescent populations. While it is readily acknowledged that the preparation and the costs associated with intervention based research are extensive, the implications for adolescent's mental health in the future may prove substantial.

## 9.4 Future Research Implications and Considerations

Chapter 5 consisted of an extensive investigation into the self-report measurement of ER and the existing empirical research involving ER in adolescent populations (Appendix M). A number of discrepancies and gaps in the previous research base were highlighted, and many of these were addressed by this thesis. The findings in Chapter 5 primarily revealed the need for longitudinal investigations which utilised a comprehensive measure of ER. As a result of this, it was clear that the major goals of this thesis would consist of establishing the temporal ordering of and potential mediation between ER, mental health, and social support. The findings from the two extensive empirical studies in this thesis have revealed that difficulties regulating negative emotions have a reciprocal relationship with mental health and well-being in adolescence. It has also confirmed that social support from a range of important individuals within an adolescent's environment is not significantly related to an adolescent's ER. The empirical works contained in this thesis

have therefore resulted in a significant contribution to the field. Nonetheless, there are now broader considerations emerging that the field must address if we are to learn more about the process of ER in the future.

Definitions of emotion regulation (ER) have undergone a continual refinement, as has our understanding of its function in the past two decades (Gross, 2014). This natural evolution has led to the recognition that ER is a complex and multidimensional construct (Gross, 2014). The Process Model has proven an excellent theoretical framework for understanding and testing stages of regulation to date. A prevalent trend pertaining to ER has been the labelling of certain strategies as either adaptive or maladaptive. With regard to the Process Model, antecedent-based ER strategies have seemingly been considered adaptive, and response strategies maladaptive (Aldao, 2013). Critically, the classification of regulatory stages as being either adaptive or maladaptive simply according to their stage of regulation, has been found to not always hold true. Research has revealed negative relationships between ER strategies considered as 'adaptive' and psychopathology, while on the other hand finding positive relationships between 'maladaptive' strategies and psychopathology (Aldao, 2013; Aldao & Nolen-Hoeksema, 2012). This finding suggests that strategy selection and subsequent use could be actively shaped, depending on contextual factors.

As a result of this, Aldao (2013) has argued that the context in which regulation occurs must be taken into account, pointing to Gratz and Roemer's (2004) comments that "knowledge of the specific emotion regulation strategies used by an individual, in the absence of information on the context in which they are used, may provide little information about the individual's ability to regulate her or his emotions effectively" (p. 42). Recently, Aldao et al. (2015) further asked how do people flexibly regulate their emotions in the face of various demands across diverse situations? Indeed, this raises

further considerations as to how we can capture and measure these interactions in the future. Gross (2013) has also pointed toward context-specific aspects such as the intensity of an experienced emotion as further factors for consideration, but fails to make any suggestions as to how these challenges may be tackled.

Recognition of the context in which an individual regulates their emotions, and how this may influence their strategy selection, is important (Bonanno & Burton, 2013). This thesis found that having access to effective ER strategies is one of the most significant dimensions of ER as measured by the DERS (Gratz & Roemer, 2004). Having access to an effective regulation strategy however relies on the individual possessing that regulatory strategy in the first place and then being able to consciously select it. As a result, a future move toward theoretical models that promote both an understanding of strategy selection and of the context in which regulation occurs, would seem essential for guiding us toward a deeper understanding of the regulation process in the future. This would seem especially the case if we are to undertake future empirical investigations into how context and the process of strategy selection may both interact.

The findings from this thesis have consistently found that access to ER strategies and engaging in goal-directed behaviour, presented as the two most important dimensions of regulation. Being able to understand more about the process whereby adolescents come to initially select and subsequently endorse a regulation strategy, seems an important aspect of the regulatory process to consider. The utilised measurement methods, design and analysis used by this thesis, did not allow any exploratory investigation of what will be described here as, the process behind strategy selection.

Bonanno and Burton (2013) have proposed a theoretical model which potentially addresses many of the limitations associated with understanding ER exclusively from a categorical perspective. They maintain that to constantly consider a specific type of

strategy as health supporting or detracting is to engage in what they refer to as the "fallacy of uniform efficacy" (Bonanno & Burton, 2013, p. 591). Bonanno and Burton (2013) argue for an approach they label as regulatory flexibility. Flexibility of regulation is a concept which would appear to be a progressive step in understanding the process *behind* the selection and use of specific strategies. This is important as, while much of the current research has asked participants to report specific strategies they find helpful or otherwise, we generally have not learnt much about which strategies may have been utilised initially, that have failed to work. This is important, as excessive attempts at ER and attending to emotion states can be related to psychopathology (Ciarrochi et al., 2011; Gross, 1998). Thus, how different individuals, especially adolescents, engage in the process of strategy selection could provide critical insights, as well as opening a new frontier of ER research. A proposed model conceptualising regulatory flexibility (Bonanno and Burton, 2013) can be seen in Figure 11.

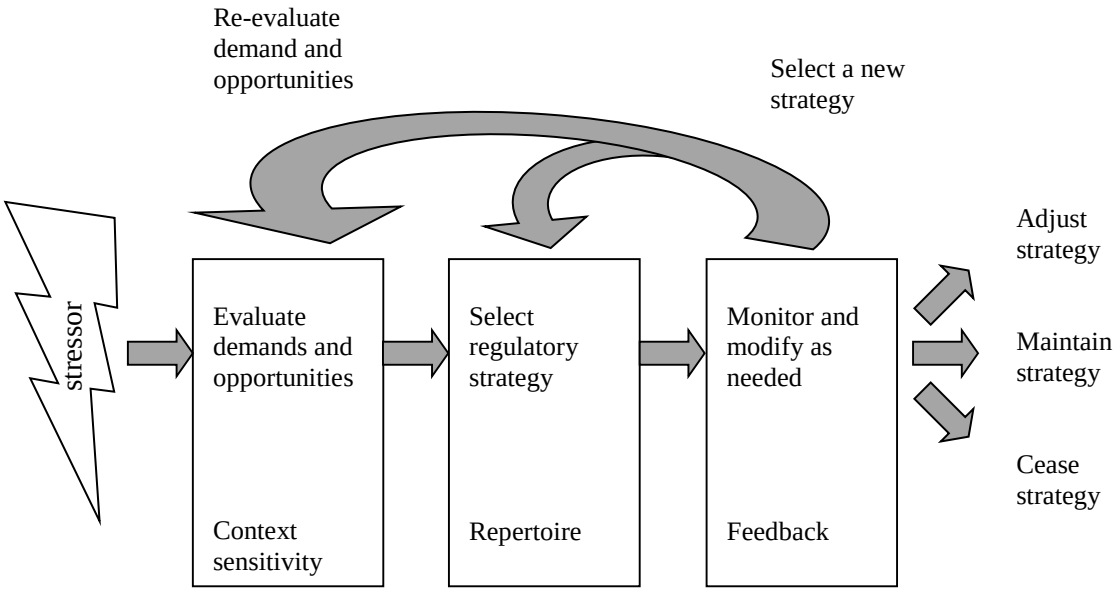


*Figure 11.* Proposed Model of Three Sequential Components of Regulatory Flexibility (Bonanno & Burton, 2013). Permission to reproduce figure granted by Dr George Bonanno (Supplementary Material C).

Bonanno and Burton's (2013) proposed model presents as a further means of understanding the process of ER that may prove helpful for future research efforts. They propose a model of regulatory flexibility composed of three sequential components: context sensitivity, repertoire, and response to feedback. This model emphasises the flexibility of strategy selection and adjusting potential strategies through multi-feedback pathways. This theoretical understanding of ER accounts for extrinsic influences, strategy repertoires, and process feedback. This model would also appear to answer recent calls for the consideration of various extrinsic and contextual factors when considering the process of ER (Aldao, 2013; Fosco & Grych, 2012). Regulatory flexibility, as proposed by Bonanno and Burton (2013), also bears some similarities to the earlier discussed Psychological Flexibility Model, that has guided the exploration of the dimensions of ER used in this thesis (Hayes et al., 2012). Importantly though, regulatory flexibility presents as a more applied model which is specific to the process of ER itself. It also focuses on the process of selecting existing strategies until an appropriate one is endorsed. Not only would this perspective of ER encourage a deeper understanding but it would also address concerns by some that emotion and its regulation are at times not being rightly understood as a fluid and multifaceted construct (Kappas, 2011).

This model of regulatory flexibility presents as a dynamic model which could help guide future research efforts. This thesis has identified that being flexible and having access to ER strategies is a vitally important dimension of regulation (see Empirical Studies 1 & 2). Nonetheless, investigating ER from the regulatory flexibility standpoint may help to deliver deeper insights into the strategy selection process. Theoretical models that emphasise context, ER repertoires and strategy selection are signs of a promising new evolution that could drive further understanding into the process of ER and not just the outcomes associated with it.

It has been the contention of this thesis that the measurement and interpretation of ER should be guided and interpreted by the dominant theoretical models. Assessing ER opens up an array of measurement considerations that must be reconciled with the existing theoretical approaches. Reaching a balance between measuring what some argue is a fluid and shifting process, and the demands of large scale research as was undertaken in this thesis is a challenge (Campos et al., 2011). For large scale longitudinal research, comprehensive self-report measures are perhaps the most appropriate option currently available. Searching for other measurement methods however may help bridge the gap and complement emerging theoretical frameworks such as regulatory flexibility; such methods may include Experience Sampling Methods (ESM).

This research tool may facilitate the assessment of ER both from a flexible and a context-specific standpoint. Bolger et al. (2003) describe ESM as "capturing life as it is lived" (p. 579). By employing ESM, this would enable the intensity, duration, and valence of the emotion experience, to all be assessed. This would provide additional information regarding the immediate context of the regulation process. It could also be used to capture the frequency of the situationally applied regulation responses one uses on a daily basis (Bolger et al., 2003). Experience Sampling Methods (ESM) would also appear to be a research method congruent with investigating Bonanno and Burton's (2013) model of regulation flexibility, and may also address many of the documented limitations of some self-report measures, that use retrospective responding and can be subject to memory biases (Hayes, 2000; Stone et al., 2000). If both self-report and ESM methods were used in conjunction, comparisons between reported use (self-report measures) and actual use (experience sampling) could be made.

The use of ESM may also provide a broader understanding of the possible regulation repertoires that adolescents draw their regulation strategies from. This

represents another exciting frontier for the field of ER research. Investigating ER from this perspective in the future will also require the use of appropriate statistical methods. Latent Profile Analysis (LPA) has been identified as an appropriate analysis method to gain insight into ER repertoire profiles over time. Latent profile analysis is a person centred statistical approach, which Turpyn Chaplin, Cook, and Martelli (2015) proposed as being suitable to use to examine patterns of regulation strategies as well as emotional discordance. Emotional discordance is understood to be where the up or down regulation of emotions may be observed to affect multiple emotional domains. These can include facial expression, physiology, or behaviour. Assessing multiple domains of emotion (facial expression, physiological responses, experience) in conjunction with comprehensive self-report measures of ER will assist with identifying patterns of emotion regulation and if emotional discordance occurs in adolescent samples. For instance, Turpyn et al. (2015) have proposed that emotional discordance occurs due to the emotion regulation process. For example, if emotions are expected to behave in accordance, then we could expect to see heightened physiological activity and furrowed brows and tightened lips as an accompanying facial expression whilst experiencing anger. Emotion discordance could be expected to have happened if an individual engaged in an ER strategy such as expression suppression and the subsequent heightened physiological activity did not now occur in conjunction with the aforementioned facial expression.

Turpyn et al. (2015) have suggested that identifying patterns of regulatory responding is important for adolescent development, but that these patterns or ER profiles are not well understood. Turpyn et al. (2015) used LPA to investigate emotion regulation profiles in 198 adolescents. They recorded observed emotion expressions, reported emotion experiences, and heart rate (HR) in response to an emotionally arousing parent–adolescent conflict task. Four distinct ER profiles were able to be identified through the

use of LPA. The first profile had moderate HR and high expression, the second was a suppression profile (with low negative emotion expression and high emotion experience), the third a low reactive profile, and fourth a high reactive profile (Turpyn et al., 2015). Different profiles were related to different measures of mental health. Adolescents who had what was termed a reactive profile were also more likely to have parents who exhibited negative parenting behaviour during the conflict interaction. This suggests that parent behaviour is related to the process of ER in adolescents in some contexts. The study used cross-sectional data so was unable to determine the causal direction the observed ER profiles may have shared with mental health. Nonetheless, Turpyn et al. (2015) were able to show that ER profiles existed in adolescents and depending on the nature of the profile have the potential to impact their mental health.

Lougheed and Hollenstein (2012) also used LPA to examine regulation repertoires in adolescents. They showed that adolescents who relied on fewer ER strategies showed higher levels of internalising problems. Broader repertoires of strategies were associated with improved psychological well-being. Understanding regulation repertoires and how they may inform an adolescent's final strategy selection is an exciting area of research with much future potential. While Turpyn et al. (2015) used LPA to identify four unique ER profiles, Lougheed and Hollenstein (2012) demonstrated the importance of broad regulation repertoires of strategies for adolescents. The latent variable in this thesis, of having access to ER strategies, was found to be significantly important for adolescents' mental health and well-being. This seems consistent with Lougheed and Hollenstein's (2012) finding that having *access* to a broad repertoire of viable strategies is beneficial. Being flexible and exhibiting awareness when selecting strategies would feasibly allow one to draw on their own regulatory repertoire more effectively. Exploration of these aspects of the regulation process will help contribute further to understanding, not just the

strategy selection but if optimal regulatory profiles exist and what types of strategies these contain.

Future research that chooses to address the topic of ER in adolescence should also acknowledge the dynamic changes which occur all throughout this developmental stage (Steinberg, 2014; Turpyn et al., 2015). Sample-based considerations specifically in adolescent populations are becoming increasingly evident within the research literature. Gross (2014) has recently emphasised that age-related differences present as an additional reason for many of the differences in results across previous studies. He recommends that further research is required into age-related differences regarding the regulation of emotion throughout adolescence. As adolescence spans multiple years, the potential for developmental differences seems justified. Indeed, Steinberg (2010) has recently summarised the dramatic changes that occurs in the brain throughout adolescence. These structural changes have been tied to emotional and psychological outcomes. Structural maturation of the prefrontal cortex has been found to be associated with cognitive control (see Riediger & Klipker, 2014 for a review). Riediger and Klipker (2014) suggest that the development of ER across adolescence is non-linear, meaning that from a neurological standpoint, ER development is an ongoing process in adolescence. This could mean that regulation repertoires could be expected to grow and be used differently throughout the period of adolescence.

Gullone and Taffe (2012) have produced empirical evidence which appears to support the viewpoint that regulation of emotions is tied to aspects of brain maturation. They have shown that some ER strategies decline with age while others, such as cognitive reappraisal, remain stable over time. This may suggest the existence of particular developmental windows, where some ER strategies become more important or are relied upon more often than others. Zimmer-Gembeck and Skinner (2011) integrated 58 studies,

thereby allowing for comparisons of coping strategies across childhood and adolescence. Their findings showed an age-trend which reflected an increase in regulation capacities. As age progression occurred so did an understanding of emotional situations and repertoires of regulatory responses. Adolescents also seemed to use more sophisticated regulation strategies and reported better emotional awareness than children. It would seem appropriate that researchers and practitioners be mindful of these age-related differences when designing and disseminating adolescent-based research in the future. Importantly, the potential for age-related differences should also be a consideration in future ER-based research when comparisons of profiles and strategies are made across studies.

This section has pointed to three key considerations for the field of ER research as it looks to develop its understanding around the process of ER further into the future. The first acknowledges the continued development and testing of new theoretical approaches focussing on the process of ER. It is hoped that Bonanno and Burton's (2013) model of ER may lead to an increased awareness around the selection of viable ER strategies in the face of negative or upsetting emotions. Emphasis on the flexibility of regulation and on the selection of strategies from developing repertoires in adolescents will contribute to a growing understanding of the process of ER. Such an understanding would also likely shine a light on the process surrounding how adolescents choose appropriate regulatory strategies (such as those identified by this thesis) in varying situations.

Secondly, to help assess the multifaceted nature of ER in deeper detail, this thesis has suggested the future use of ESM, in conjunction with existing self-report methods. This may allow for aspects of ER and the emotion experience to be assessed for which self-reports are unsuitable. These include aspects such as daily emotion valence, intensity, emotional discordance, and thought processes associated with ER strategy selection. Using statistical methods such as LPA which are suitable for investigating regulation repertoires

and patterns or profiles should be embraced. The inclusion of repertoire-focussed research designs and analysis should complement our focus on identifying important individual strategies which have a focus on being flexible and goal focussed.

Lastly, adolescence is an exciting developmental period for research. Physical, psychological, and social changes are all well documented throughout this stage. The final consideration surrounding age-related differences centres on the contention that the dynamic stage of adolescence could be more age-specific than first thought (Riediger & Klipker, 2014). The individual stage of a young person's maturation may therefore contribute to differences in their ER strategy repertoires and selection (Zimmer-Gembeck & Skinner (2011). As a result, those who make comparisons of research findings between studies should be mindful of any significant age differences within the populations used by each study. Findings should be reported appropriately and with care to prevent generalisations being made that concern the entire development period of adolescence.

## 9.5 Limitations

This thesis has investigated how the highly popular construct of ER is related to well-being and mental health in a large population of adolescents. This extensive undertaking firstly saw the identification and assessment of a range of self-report ER measures. This included an examination of the existing empirical literature in which these measures had been utilised (Chapter 5). As a result, a comprehensive self-report measure (DERS; Gratz & Roemer, 2004) was selected for the empirical components of this thesis. The two completed empirical studies addressed the knowledge gaps related to the temporal ordering of ER and mental health in adolescence. This was done with robust and powerful statistical methods. As discussed in preceding sections, the two longitudinal studies found support for significant reciprocal relationships between multiple dimensions of ER, well-being and mental health. The strongest dimensions of ER related to mental health proved

to be an adolescent's ability to access regulation strategies and to engage in goal-directed behaviour during times of negative emotion. Further investigations found no evidence for ER mediating social support and mental health. Parental and teacher social support was recorded as sharing significantly direct effects with adolescent mental health across time. Across both empirical studies, multiple dimensions of ER were consistently found to share reciprocal relationships with well-being and mental health. As a result, all three major pieces of work within this thesis have furthered knowledge and made a significant contribution to the field. While these contributions are significant, the thesis is not without its limitations.

In this limitations section, rather than simply restating each of the individual limitations associated with each of the three major pieces of work, some broader limitations will be noted. The introductory chapters of this thesis served to highlight just how multifaceted the process of ER is. Consideration of the Process Model made it clear that ER can be understood to occur at various stages of the emotion cycle (Gross & Thompson, 2007). Furthermore, it is understood that a range of different ER strategies may be employed across the emotion cycle as outlined in the introductory chapters (Gross, 2014; Hayes et al., 2012). It was the intention of this thesis to assess the effects of ER that were consistent with dimensions of regulation representative of an acceptance based and flexible approach. It was also decided that assessing the regulation of negative emotions was the most appropriate, due to the strong relationship between negative emotions and psychopathology (Bloch et al., 2010; Kring & Sloan, 2010). As a result, a self-report measure that was deemed comprehensive, and that assessed the regulation responses to negative emotions, was selected.

As noted by Gross (2014), we can only learn about ER strategies through our comparisons with other strategies. It follows that comparisons are largely confined

therefore, to the number of ER dimensions present in the utilised measure. A primary limitation of this thesis was the inability to draw comparisons between response-focussed regulation and antecedent-based regulation strategies. It was not the primary intention of this thesis to be able to do this, and practical reasons, including survey space and costs, also precluded the inclusion of further self-report measures. Nonetheless, it must be noted that the inability to compare across both antecedent and response stages of ER is a limitation of this thesis.

Capturing a broader view of the process of ER should be a consideration when using self-report tools. This thesis has suggested blending self-report subscales from existing antecedent and response-focussed measures as a way of addressing this. This would allow for the assessment of more of the regulation cycle. Measures such as the ERQ-CA (Gross & John, 2003) that contains the well-validated antecedent cognitive reappraisal scale, would prove ideal in this instance. This would serve two important purposes. Firstly, it would enable important comparisons to be made across time. Secondly, it would increase the number of strategies under measure. The potential benefits of addressing this limitation in the future are many. The logistical constraints associated with undertaking the longitudinal research in this thesis led to the limiting of additional measures.

A secondary overall limitation associated with this thesis pertains to an aspect of the adolescent population sampled. The empirical components of the thesis utilised a large sample of adolescents, with comparable proportions of boys and girls. The size of the population used in this thesis was shown to far exceed that of previous studies (see Systematic Review findings). Regardless, it should be acknowledged that some limitations associated with this sample could affect the generalisability of the findings for some members of the adolescent population. These could include the lower socioeconomic

sections of the community and clinical based populations. The utilised population was exclusively sourced from students who attended private Catholic secondary schools that were mostly in city or large regional centres. Participating adolescents were predominantly from middle to higher socio-economic status households. They also largely belonged to families that were intact, with at least one parent holding employment.

The prime concern is whether the utilised population can be considered representative of adolescents as a whole. While it was not the intention to examine the process of ER in a clinical context or disadvantaged population, ER development and experience have previously been recorded as being influenced by socio-economic factors and family background. Raver (2004) reports that children from lower socio-economic backgrounds have different expectations as to how their peers will respond to their distress. As a result, this can influence their emotional reactivity and self-regulation (Raver, 2004). Children and adolescents raised in lower income regions are also often exposed to stressors that may result in a disruption to their emotional processes (Houltberg, Henry, & Morris, 2012). Cole et al. (1994) states that a key developmental task for adolescents is the ability to regulate positive and negative emotions along a number of dimensions, and in ways that support cognitive, behavioural, and social functioning (Cole et al., 1994). The capacity to successfully develop this ability may be impaired by less than optimal social influences. It is likely that some of the emotion-related difficulties associated with living in disadvantaged backgrounds, were not present in the sample of adolescents studied in this thesis. As a result, research questions such as whether young people from specific backgrounds report differences in ER could not be pursued and answered by this thesis.

This section has outlined what can be considered the two most salient limitations of this thesis. While the longitudinal research undertaken in this thesis has offered many opportunities to further our knowledge, it is not a panacea. There are always further

considerations beyond establishing the magnitude of a relationship and identifying the most important dimensions of ER. Perhaps some of the listed limitations are reflective of the broader issues that many ER-focussed studies face. Regardless, this thesis falls short on being able to contribute to the debate surrounding the efficacy of the different stages of regulation, and whether adolescents from lower socio-economic backgrounds suffer from differences in regulation compared to their more privileged peers. Nonetheless, this thesis has yielded significant insights into regulatory responses and their relationship with well-being and mental health across time, in a non-clinical sample of adolescents. Concerns regarding the generalisability of these findings must be acknowledged and taken into consideration by the reader. The representativeness of samples is an issue encountered across much psychological science research. It should also be kept in mind that this thesis did not set out to investigate ER in either a clinical or lower socio-economic population. Rather, it set its focus on the broader goal of investigating ER across adolescence in the developmental period. Large sampling can contribute to ensuring a representative population is tested. In the case of the empirical studies undertaken in this thesis, the possibility that an insufficient number of adolescents from the lower end of the socio-economic spectrum remains a possibility.

## 9.6 Final Summary

This thesis has investigated the relationship between six dimensions of emotion regulation (ER), well-being, and mental health in adolescence. In the past, clarity regarding the direction of the relationship between ER and mental health in adolescents was not clear due to the paucity of longitudinal research previously undertaken. Difficulties in regulating emotion, subsequently, had often been considered both a risk factor and a symptom of poorer mental health. Emotion regulation (ER) had also been hypothesised as a potentially mediating factor between social support and psychological health. This thesis conducted

two large empirical studies which aimed to clarify the nature of the relationship between ER and adolescent mental health over time. By utilising a large sample of adolescents and an appropriate longitudinal design, it was confirmed that some dimensions of ER hold more importance than others. The results confirmed that, rather than being exclusively an antecedent to mental health, flexible based regulatory responses share a largely reciprocal relationship with mental health in early to mid-adolescence. While the size of this relationship was not large, in the final empirical study it was found to be robust across three years. Whether ER mediates social support and metal health was also extensively investigated. While mediation was not confirmed as being present, the importance of perceived parental social support for adolescent mental health was a major finding.

This thesis has also highlighted the measurement issues and practical challenges associated with undertaking ER-based research. While ER is undoubtedly a popular construct, it is broad, and can be seen to suffer from definitional and measurement ambiguity. A number of recommendations have arisen from this thesis which could serve to improve future ER-focussed research. The first and foremost of these must be that of Cole et al. (2004), who stipulated that researchers should explicitly state their working hypothesis of ER. Further, clarification and identification of which regulation stages of the emotion process (e.g., antecedent or response focussed) are being measured, must also be included in any definition under which future studies work. This will be of crucial assistance when interpreting the results from various studies which are published under the popular topic of ER.

Importantly, this thesis has revealed that dimensions of ER that are consistent with being flexible in strategy selection and goal-focussed behaviour, are vitally important for adolescents over time. It has been suggested that future research should not be rigid in its interpretation of the use of specific ER strategies, but should also seek to test for the

influences of contextual variations and how these may influence strategy selection (Aldao et al., 2015). Assessing the regulation of emotion, not just in isolation but in conjunction with contextual and social factors, is vital for the evolvement of our understanding pertaining to the process of ER (Fosco & Grych, 2012).

This thesis has also resulted in various suggestions aimed at improving research with the existing measurement methods. Utilising combinations of self-report measures will address the need for comparisons between antecedent and response-focussed strategies in future research. Embracing alternative measurement tools such as Experience Sampling Methods (ESM) in conjunction with self-report measures may also contribute further to insights regarding ER flexibility and the process of strategy selection.

Finally, this thesis has collated and reviewed previous empirical studies focussing on ER in adolescent populations. The predominant theme in previous research appears to be firmly on investigating what psychological outcomes are related to various reported ER strategies without accounting for social factors within an adolescent's environment. Furthermore, the paucity of research which has delivered, and evaluated the effectiveness of ER informed interventions in adolescent samples is alarming. This matter was highlighted in the implications section of this thesis, where it is identified that there are major research opportunities to deliver ER-specific interventions in adolescent populations. This progression could be achieved if practitioners and researchers alike worked to respond to the findings in this thesis, in the form of delivering and evaluating ER based psychological interventions.

## 9.7 Conclusion

Until now, extensive longitudinal investigations involving the popular construct of ER in adolescent populations were rare. This thesis embraced a broad scope, and its contributions are substantial. The research field which focuses on the process of regulating

one's emotions has undergone exponential growth, and many facets of the ER process remain understudied. Recognition of the significance that flexible access to regulation strategies and goal directed behaviour can have for continued adolescent well-being and mental health, is a clear message arising from this thesis. Large scale reviews of ER measures, evaluation of the empirical literature, and completion of longitudinal research, such as that undertaken within this thesis, serve both to evaluate our knowledge to date and to advance it into the future.

The continuation of research which examines psychological processes in adolescent populations is important for the future insights that will help support optimal transitions into adulthood. The youth of today will be the individuals who help shape the world of the future, and how they function and deal with difficult emotions will underlie that. As a result, learning how the intense emotional experiences associated with adolescence are best regulated, is one specific but critical area for continuing focus in the psychological sciences. Until this thesis, much of the existing ER-focussed research with adolescents was promising but significantly smaller in scale and limited in their conclusions. The magnitude of the empirical studies within this thesis has helped to provided much insight into and clarification regarding, the process of ER and mental health in adolescents. Among other things, it is hoped that the completion of this thesis will serve as an impetus for future psychological preventative intervention work that involves awareness of emotions and optimal regulatory responses. Ideally this would contribute to the higher purpose of this thesis, by helping to improve young peoples' psychological health into the future.

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# Appendices

## Appendix A: Author's Permission to reproduce Figure 1

Dear Guilford Press,

My name is Loch Forsyth. I am currently finishing my PhD at the Australian Catholic University of Australia.
My thesis is titled 'Emotion Regulation and Adolescence: A Longitudinal Investigation.'

I am writing to ask permission if I may include in my thesis a figure from one of your recent publications. The title of the publication is 'The Handbook of Emotion Regulation (2nd edition) and the editor is James J Gross. The Figure I wish to use is listed as Figure 1.1 on page 4. (E.g., **Figure 1.** Number of publications containing the exact phrase "emotion regulation" in GOOGLE SCHOLAR from 1990-2012 (as published in Gross, 2013). Note this is not a cumulative plot-each point represents the citation count for that single year).

If your permission is granted, the figure would be reproduced in the opening pages of my thesis to highlight the popularity of emotion regulation. It would of course be accompanied by the appropriate citation with a copy of your permission to reproduce (if you grant permission).

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Kind Regards
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Please let me know if you have any questions.
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## Appendix B: Permission to Reproduce the Process Model and the Modal Model of Emotion

Dear Professor James Gross,

Hope you are well.

My name is Loch Forsyth. I am currently finishing my PhD at the Australian Catholic University of Australia.

My primary supervisor is Professor Joseph Ciarrochi.

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Kind Regards

Loch Forsyth

(Reply from Professor James J Gross)

You'd be welcome to use these figures for this purpose.

Best,

James

(October 24, 2014)

## Appendix C: Request for Permission to Reproduce the Psychological Flexibility Model

Dear Dr Steven Hayes,

Hope you are well.

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Kind Regards
Loch Forsyth

Hi Loch
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Steven C. Hayes
Foundation Professor and Director of Clinical Training
Department of Psychology /298
University of Nevada
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## Appendix D: DERS Item subscales based on Gratz & Roemer (2004)

| | Almost Never | | | | Almost Always |
|---|---|---|---|---|---|
| 1 …When I'm upset I become angry with myself for feeling that way | 1 | 2 | 3 | 4 | 5 |
| 2 … When I'm upset, I acknowledge my emotions | 1 | 2 | 3 | 4 | 5 |
| 3 … When I'm upset I become embarrassed for feeling that way | 1 | 2 | 3 | 4 | 5 |
| 4 … When I'm upset I have difficulty getting work done | 1 | 2 | 3 | 4 | 5 |
| 5 … When I'm upset I become irritated with myself for feeling that way | 1 | 2 | 3 | 4 | 5 |
| 6 … When I'm upset I feel ashamed with myself for feeling that way | 1 | 2 | 3 | 4 | 5 |
| 7 … When I'm upset I have difficulty controlling my behaviours | 1 | 2 | 3 | 4 | 5 |
| 8 … When I'm upset I have difficulty focussing on other things | 1 | 2 | 3 | 4 | 5 |
| 9 … When I'm upset I feel like I am weak | 1 | 2 | 3 | 4 | 5 |
| 10 … When I'm upset I have difficulty thinking about anything else | 1 | 2 | 3 | 4 | 5 |
| 11 … When I'm upset I have difficulty concentrating | 1 | 2 | 3 | 4 | 5 |
| 12 … When I'm upset I can still get things done | 1 | 2 | 3 | 4 | 5 |
| 13 … When I'm upset I feel guilty for feeling that way | 1 | 2 | 3 | 4 | 5 |
| 14 … When I'm upset I feel like I can remain in control of my behaviours | 1 | 2 | 3 | 4 | 5 |
| 15 … When I'm upset I care about what I am feeling | 1 | 2 | 3 | 4 | 5 |

| | | | | | |
|---|---|---|---|---|---|
| 16 … When I'm upset I experience my emotions as overwhelming and out of control | 1 | 2 | 3 | 4 | 5 |
| 17 … When I'm upset I feel out of control | 1 | 2 | 3 | 4 | 5 |
| 18 … When I'm upset I am attentive to my feelings | 1 | 2 | 3 | 4 | 5 |
| 19 … When I'm upset I believe that I will remain that way for a long time | 1 | 2 | 3 | 4 | 5 |
| 20 … When I'm upset I lose control over my behaviour | 1 | 2 | 3 | 4 | 5 |
| 21 …When I'm upset, I believe that my feelings are valid and important | 1 | 2 | 3 | 4 | 5 |
| 22 … When I'm upset I become out of control | 1 | 2 | 3 | 4 | 5 |
| 23 …When I'm upset, I take time to figure out what I'm really feeling | 1 | 2 | 3 | 4 | 5 |
| 24 … When I'm upset I am confused about how I feel | 1 | 2 | 3 | 4 | 5 |
| 25 … When I'm upset it takes me a long time to feel better | 1 | 2 | 3 | 4 | 5 |
| 26 … When I'm upset I believe that wallowing in it is all I can do | 1 | 2 | 3 | 4 | 5 |
| 27 … When I'm upset I have difficulty making sense out of my feelings | 1 | 2 | 3 | 4 | 5 |
| 28 … When I'm upset I believe that there is nothing I can do to make myself feel better | 1 | 2 | 3 | 4 | 5 |
| 29 … When I'm upset I know that I can find a way to eventually feel better | 1 | 2 | 3 | 4 | 5 |
| 30 … When I'm upset I have no idea how I am feeling | 1 | 2 | 3 | 4 | 5 |
| 31 ... When I'm upset I am clear about my feelings | 1 | 2 | 3 | 4 | 5 |
| 32 … When I'm upset I believe that I'll end up feeling very depressed | 1 | 2 | 3 | 4 | 5 |

| | | | | | |
|---|---|---|---|---|---|
| 33 … When I'm upset I pay attention to how I feel | 1 | 2 | 3 | 4 | 5 |
| 34 … When I'm upset my emotions feel overwhelming | 1 | 2 | 3 | 4 | 5 |
| 35 … When I'm upset I know exactly how I am feeling | 1 | 2 | 3 | 4 | 5 |
| 36 … When I'm upset I start to feel very bad about myself | 1 | 2 | 3 | 4 | 5 |

**Clarity (5 Items) Item 24, 27, 30, 31, 35.**

**Strategies (8 items) Item 19, 25, 26, 28, 29, 32, 34, 36.**

**Awareness (6 Items) Item 2, 15, 18, 21, 23, 33**

**Impulse (6 Items) Item 7, 14, 16, 17, 20, 22**

**Goals (5 items) Item 4, 8, 10, 11, 12**

**Non-Acceptance (6 Items) Item 1, 3, 5, 6, 9, 13**

## Appendix E: Cognitive Emotion Regulation Questionnaire (CERQ; Garnefski, Kraaij, & Spinhoven 2001)

| | Never | Sometimes | Regularly | Often | Nearly Always |
|---|---|---|---|---|---|
| **Self Blame** | | | | | |
| I feel that I am the one to blame for it. | 1 | 2 | 3 | 4 | 5 |
| I feel that I am the one who is responsible for what has happened. | 1 | 2 | 3 | 4 | 5 |
| I think about the mistakes I have made in this matter. | 1 | 2 | 3 | 4 | 5 |
| I think that basically the cause must lie within myself. | 1 | 2 | 3 | 4 | 5 |
| **Acceptance** | | | | | |
| I think that I have to accept that this has happened. | 1 | 2 | 3 | 4 | 5 |
| I think that I have to accept the situation. | 1 | 2 | 3 | 4 | 5 |
| I think that I cannot change anything about it. | 1 | 2 | 3 | 4 | 5 |
| I think that I must learn to live with it. | 1 | 2 | 3 | 4 | 5 |
| **Focus on thought/rumination** | | | | | |
| I often think about how I feel about what I have experienced. | 1 | 2 | 3 | 4 | 5 |
| I am preoccupied with what I think and feel about what I have experienced. | 1 | 2 | 3 | 4 | 5 |
| I want to understand why I feel the way I do about what I have experienced | 1 | 2 | 3 | 4 | 5 |
| I dwell upon the feelings the situation has evoked in me. | 1 | 2 | 3 | 4 | 5 |
| **Positive refocussing** | | | | | |
| I think of nicer things than what I have experienced. | 1 | 2 | 3 | 4 | 5 |
| I think of pleasant things that have nothing to do with it. | 1 | 2 | 3 | 4 | 5 |
| I think of something nice instead of what has happened. | 1 | 2 | 3 | 4 | 5 |
| I think about pleasant experiences. | 1 | 2 | 3 | 4 | 5 |
| **Refocus on planning** | | | | | |
| I think of what I can do best. | 1 | 2 | 3 | 4 | 5 |
| I think about how I can best cope with the situation. | 1 | 2 | 3 | 4 | 5 |
| I think about how to change the situation. | 1 | 2 | 3 | 4 | 5 |
| I think about a plan of what I can do best. | 1 | 2 | 3 | 4 | 5 |

| | | | | | |
|---|---|---|---|---|---|
| **Positive reappraisal** | | | | | |
| I think I can learn something from the situation. | **1** | **2** | **3** | **4** | **5** |
| I think that I can become a stronger person as a result of what has happened. | **1** | **2** | **3** | **4** | **5** |
| I think that the situation also has its positive sides. | **1** | **2** | **3** | **4** | **5** |
| I look for the positive sides to the matter. | **1** | **2** | **3** | **4** | **5** |
| **Putting into perspective** | | | | | |
| I think that it all could have been much worse. | **1** | **2** | **3** | **4** | **5** |
| I think that other people go through much worse experiences. | **1** | **2** | **3** | **4** | **5** |
| I think that it hasn't been too bad compared to other things. | **1** | **2** | **3** | **4** | **5** |
| I tell myself that there are worse things in life. | **1** | **2** | **3** | **4** | **5** |
| **Catastrophizing** | | | | | |
| I often think that what I have experienced is much worse than what others have experienced. | **1** | **2** | **3** | **4** | **5** |
| I keep thinking about how terrible it is what I have experienced. | **1** | **2** | **3** | **4** | **5** |
| I often think that what I have experienced is the worst that can happen to a person. | **1** | **2** | **3** | **4** | **5** |
| I continually think how horrible the situation has been. | **1** | **2** | **3** | **4** | **5** |
| **Blaming others** | | | | | |
| I feel that others are to blame for it. | **1** | **2** | **3** | **4** | **5** |
| I feel that others are responsible for what has happened. | **1** | **2** | **3** | **4** | **5** |
| I think about the mistakes others have made in this matter. | **1** | **2** | **3** | **4** | **5** |
| I feel that basically the cause lies with others. | **1** | **2** | **3** | **4** | **5** |

## Appendix F: Emotion Regulation Questionnaire (ERQ; Gross & John 2003)

The Emotion Regulation Questionnaire is designed to assess individual differences in the habitual use of two emotion regulation strategies: cognitive reappraisal and expressive suppression.

**Citation**

Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. Journal of Personality and Social Psychology, 85, 348-362.

**Instructions and Items**

We would like to ask you some questions about your emotional life, in particular, how you control (that is, regulate and manage) your emotions. The questions below involve two distinct aspects of your emotional life. One is your emotional experience, or what you feel like inside. The other is your emotional expression, or how you show your emotions in the way you talk, gesture, or behave. Although some of the following questions may seem similar to one another, they differ in important ways. For each item, please answer using the following scale:

**1----------2----------3----------4----------5----------6----------7**

**Strongly Disagree** **Neutral** **Strongly Agree**

1. ____ When I want to feel more *positive* emotion (such as joy or amusement), I *change what I'm thinking about*.
2. ____ I keep my emotions to myself.
3. ____ When I want to feel less *negative* emotion (such as sadness or anger), I *change what I'm thinking about*.
4. ____ When I am feeling *positive* emotions, I am careful not to express them.
5. ____ When I'm faced with a stressful situation, I make myself *think about it* in a way that helps me stay calm.
6. ____ I control my emotions by *not expressing them.*
7. ____ When I want to feel more *positive* emotion, I *change the way I'm thinking* about the situation.
8. ____ I control my emotions by *changing the way I think* about the situation I'm in.
9. ____ When I am feeling *negative* emotions, I make sure not to express them.
10. ____ When I want to feel less *negative* emotion, I *change the way I'm thinking* about the situation.

**Note**

Do not change item order, as items 1 and 3 at the beginning of the questionnaire define the terms "positive emotion" and "negative emotion".

**Scoring (no reversals)** Reappraisal Items: 1, 3, 5, 7, 8, 10; Suppression Items: 2, 4, 6, 9.

## Appendix G: Emotion Regulation Questionnaire (youth)

These 10 questions are about how you feel inside, and how you show your emotions/feelings. Some of the questions may seem similar to one another, but they are different in important ways.
Please read each statement, and then **circle** the choice that seems **most true for you**.
Do not spend too much time on any one item. Remember, this is not a test. There are no right or wrong answers. We really want to know what you think.

| | | | | | |
|---|---|---|---|---|---|
| 1. When I want to feel happier, I think about something different. | Strongly Disagree | Disagree | Half and half | Agree | Strongly Agree |
| 2. I keep my feelings to myself | Strongly Disagree | Disagree | Half and half | Agree | Strongly Agree |
| 3. When I want to feel less bad (e.g., sad, angry or worried), I think about something different. | Strongly Disagree | Disagree | Half and half | Agree | Strongly Agree |
| 4. When I am feeling happy, I am careful not to show it. | Strongly Disagree | Disagree | Half and half | Agree | Strongly Agree |
| 5. When I'm worried about something, I make myself think about it in a way that helps me feel better. | Strongly Disagree | Disagree | Half and half | Agree | Strongly Agree |
| 6. I control my feelings by not showing them | Strongly Disagree | Disagree | Half and half | Agree | Strongly Agree |
| 7. When I want to feel happier about something, I change the way I'm thinking about it. | Strongly Disagree | Disagree | Half and half | Agree | Strongly Agree |
| 8. I control my feelings about things by changing the way I think about them. | Strongly Disagree | Disagree | Half and half | Agree | Strongly Agree |
| 9. When I'm feeling bad (e.g., sad, angry, or worried), I'm careful not to show it. | Strongly Disagree | Disagree | Half and half | Agree | Strongly Agree |
| 10. When I want to feel less bad (e.g., sad, angry, or worried) about something, I change the way I'm thinking about it. | Strongly Disagree | Disagree | Half and half | Agree | Strongly Agree |

*Note.* Adapted from Gross, J.J., & John, O.P. (2003)

## Appendix H: The Regulation of Emotions Questionnaire (REQ; Phillips & Power, 2007)

| F1 | Not at all | | | | Always |
|---|---|---|---|---|---|
| I harm or punish myself in some way | 1 | 2 | 3 | 4 | 5 |
| I dwell on my thoughts and feelings | 1 | 2 | 3 | 4 | 5 |
| I think about people better off | 1 | 2 | 3 | 4 | 5 |
| I keep the feeling locked up inside | 1 | 2 | 3 | 4 | 5 |
| Things feel unreal | 1 | 2 | 3 | 4 | 5 |

| F2 | Not at all | | | | Always |
|---|---|---|---|---|---|
| I review (re-think) my thoughts or beliefs | 1 | 2 | 3 | 4 | 5 |
| I review (re-think) my goals or plans | 1 | 2 | 3 | 4 | 5 |
| I put the situation into perspective | 1 | 2 | 3 | 4 | 5 |
| I concentrate on a pleasant activity | 1 | 2 | 3 | 4 | 5 |
| I plan what I could do better next time | 1 | 2 | 3 | 4 | 5 |

| F3 | Not at all | | | | Always |
|---|---|---|---|---|---|
| I take my feelings out on others verbally | 1 | 2 | 3 | 4 | 5 |
| I take my feelings out on others physically | 1 | 2 | 3 | 4 | 5 |
| I try to make others feel bad | 1 | 2 | 3 | 4 | 5 |
| I bully other people | 1 | 2 | 3 | 4 | 5 |
| I take my feelings out on objects around me | 1 | 2 | 3 | 4 | 5 |

| F4 | Not at all | | | | Always |
|---|---|---|---|---|---|
| I talk to someone about how I feel | 1 | 2 | 3 | 4 | 5 |
| I seek physical contact from friends/family | 1 | 2 | 3 | 4 | 5 |
| I do something energetic | 1 | 2 | 3 | 4 | 5 |
| I ask others for advice | 1 | 2 | 3 | 4 | 5 |

## Appendix I: The Emotion Regulation Index for Children and Adolescents (ERICA; Macdermott, Gullone, Allen, King, & Tonge, 2010)

| **Factor I: Emotional Control** | **Strongly Disagree** | | **Neutral** | | **Strongly Agree** |
|---|---|---|---|---|---|
| I have trouble waiting for something I want | **1** | **2** | **3** | **4** | **5** |
| I annoy others by not minding my own business | **1** | **2** | **3** | **4** | **5** |
| I have angry outbursts | **1** | **2** | **3** | **4** | **5** |
| I can be disruptive at the wrong times | **1** | **2** | **3** | **4** | **5** |
| I get angry when adults tell me what I can and cannot do | **1** | **2** | **3** | **4** | **5** |
| I do things without thinking about them first | **1** | **2** | **3** | **4** | **5** |
| When things don't go my way I get upset easily | **1** | **2** | **3** | **4** | **5** |

| **Factor II: Emotional Self-Awareness** | **Strongly Disagree** | | **Neutral** | | **Strongly Agree** |
|---|---|---|---|---|---|
| I am a sad person | **1** | **2** | **3** | **4** | **5** |
| I am a happy person | **1** | **2** | **3** | **4** | **5** |
| When I get upset, I can get over it quickly | **1** | **2** | **3** | **4** | **5** |
| I am quiet and shy, and I don't show my feelings | **1** | **2** | **3** | **4** | **5** |
| I handle it well when things change or I have to try something new | **1** | **2** | **3** | **4** | **5** |

| **Factor III: Situational Responsiveness** | **Strongly Disagree** | | **Neutral** | | **Strongly Agree** |
|---|---|---|---|---|---|
| When other kids are friendly to me, I am friendly to them | **1** | **2** | **3** | **4** | **5** |
| When others are upset, I become sad or concerned for them | **1** | **2** | **3** | **4** | **5** |
| When adults are friendly to me, I am friendly to them | **1** | **2** | **3** | **4** | **5** |
| I enjoy seeing others hurt or upset | **1** | **2** | **3** | **4** | **5** |

## Appendix J: The Emotion Expression Scale for Children (EESC; Penza-Clyve & Zeman, 2002)

| Lack of Emotional Awareness (8 Items) | | | | | |
|---|---|---|---|---|---|
| When I am upset, I do not know how to talk about it | **Not at all 1** | **A little true 2** | **Somewhat true 3** | **Very true 4** | **Extremely true 5** |
| I often do not know why I am angry | **Not at all 1** | **A little true 2** | **Somewhat true 3** | **Very true 4** | **Extremely true 5** |
| Sometimes I just don't have the words to describe how I feel | **Not at all 1** | **A little true 2** | **Somewhat true 3** | **Very true 4** | **Extremely true 5** |
| I often do not know how I am feeling | **Not at all 1** | **A little true 2** | **Somewhat true 3** | **Very true 4** | **Extremely true 5** |
| People tell me I should talk about my feelings more often | **Not at all 1** | **A little true 2** | **Somewhat true 3** | **Very true 4** | **Extremely true 5** |
| When something bad happens, I feel like exploding | **Not at all 1** | **A little true 2** | **Somewhat true 3** | **Very true 4** | **Extremely true 5** |
| I know I should show my feelings, but it is to hard | **Not at all 1** | **A little true 2** | **Somewhat true 3** | **Very true 4** | **Extremely true 5** |
| I have feelings that I can't figure out | **Not at all 1** | **A little true 2** | **Somewhat true 3** | **Very true 4** | **Extremely true 5** |

| Lack of Motivation to Express Negative Emotion (8 Items) | | | | | |
|---|---|---|---|---|---|
| I prefer to keep my feelings to myself | **Not at all 1** | **A little true 2** | **Somewhat true 3** | **Very true 4** | **Extremely true 5** |
| I don't show how I really feel in order not to hurt others feelings | **Not at all 1** | **A little true 2** | **Somewhat true 3** | **Very true 4** | **Extremely true 5** |
| I do not like to talk about how I feel | **Not at all 1** | **A little true 2** | **Somewhat true 3** | **Very true 4** | **Extremely true 5** |
| When I'm sad I try not to show it | **Not at all 1** | **A little true 2** | **Somewhat true 3** | **Very true 4** | **Extremely true 5** |
| When I get upset, I am afraid to show it | **Not at all 1** | **A little true 2** | **Somewhat true 3** | **Very true 4** | **Extremely true 5** |
| I usually do not talk to people until they talk to me first | **Not at all 1** | **A little true 2** | **Somewhat true 3** | **Very true 4** | **Extremely true 5** |
| It is hard for me to show how I feel about somebody | **Not at all 1** | **A little true 2** | **Somewhat true 3** | **Very true 4** | **Extremely true 5** |
| Other people don't like it when you show how you really feel | **Not at all 1** | **A little true 2** | **Somewhat true 3** | **Very true 4** | **Extremely true 5** |

## Appendix K: The Children's Emotion Management (CEMS = CSMS + CAMS; Zeman, Shipman, & Penza-Clyve, 2001) Scale

### Children's Emotion Management Scale: SADNESS

Instructions: Please circle the response that best describes your behavior when you are feeling **sad**.

| | | | |
|---|---|---|---|
| 1. When I'm feeling sad, I can control my crying and carrying on. | Hardly Ever **1** | Sometimes **2** | Often **3** |
| 2. I hold my sad feelings in. | Hardly Ever **1** | Sometimes **2** | Often **3** |
| 3. I stay calm and don't let sad things get to me. | Hardly Ever **1** | Sometimes **2** | Often **3** |
| 4. I whine/fuss about what's making me sad. | Hardly Ever **1** | Sometimes **2** | Often **3** |
| 5. I hide my sadness. | Hardly Ever **1** | Sometimes **2** | Often **3** |
| 6. When I'm sad, I do something totally different until I calm down. | Hardly Ever **1** | Sometimes **2** | Often **3** |
| 7. I get sad inside but don't show it. | Hardly Ever **1** | Sometimes **2** | Often **3** |
| 8. I can stop myself from losing control of my sad feelings. | Hardly Ever **1** | Sometimes **2** | Often **3** |
| 9. I cry and carry on when I'm sad. | Hardly Ever **1** | Sometimes **2** | Often **3** |
| 10. I try to calmly deal with what is making me sad. | Hardly Ever **1** | Sometimes **2** | Often **3** |
| 11. I do things like mope around when I'm sad. | Hardly Ever **1** | Sometimes **2** | Often **3** |
| 12. I'm afraid to show my sadness. | Hardly Ever **1** | Sometimes **2** | Often **3** |

## Appendix L: Children's Emotion Management Scale: ANGER

Instructions: Please circle the response that best describes your behavior when you are feeling **mad**.

| | | | |
|---|---|---|---|
| 1. When I am feeling mad, I control my temper. | Hardly-Ever **1** | Sometimes **2** | Often **3** |
| 2. I hold my anger in. | Hardly-Ever **1** | Sometimes **2** | Often **3** |
| 3. I stay calm and keep my cool when I am feeling mad. | Hardly-Ever **1** | Sometimes **2** | Often **3** |
| 4. I do things like slam doors when I am mad. | Hardly-Ever **1** | Sometimes **2** | Often **3** |
| 5. I hide my anger. | Hardly-Ever **1** | Sometimes **2** | Often **3** |
| 6. I attack whatever it is that makes me mad. | Hardly-Ever **1** | Sometimes **2** | Often **3** |
| 7. I get mad inside but I don't show it. | Hardly-Ever **1** | Sometimes **2** | Often **3** |
| 8. I can stop myself from losing my temper. | Hardly-Ever **1** | Sometimes **2** | Often **3** |
| 9. I say mean things to others when I am mad. | Hardly-Ever **1** | Sometimes **2** | Often **3** |
| 10. I try to calmly deal with what is making me feel mad. | Hardly-Ever **1** | Sometimes **2** | Often **3** |
| 11. I'm afraid to show my anger. | Hardly-Ever **1** | Sometimes **2** | Often **3** |

**Appendix M:** *Table 2 Empirical Studies Utilising Emotion Regulation Measures*

| Study [a] | Sample Size; Age; Sample Type | Emotional-Regulation Measures | Design | Summary of Results [b] |
|---|---|---|---|---|
| Adrian, Zeman, Erdley, Lisa, Homan, & Sim (2009) | N = 140 adolescents (71% females; Mean Age = 16.03; Consecutive admissions to an adolescent psychiatric unit over a 12-month period. Parent reports from ERC were also used in conjunction for this study. | DERS; ERC (Shields & Cicchetti, 1997) | Cross-sectional | Aspects of ER differ between internalizing/externalizing behaviour. Family cohesion associated with adaptive ER behaviours for girls on internalizing dimensions and all dimensions for externalizing. |
| Adrian, Zeman, Erdley, Lisa, & Sim (2011) | N = 99 adolescent girls; Mean Age = 16.08; Psychiatrically hospitalized at risk for NSSI. | DERS; EESC | Cross-sectional | Adolescents without peer and family support for managing emotions and those in relationships experiencing conflict reported more ED. |
| Bender, Reinholdt, Esbjørn, & Pons (2012) | N = 544 children and adolescents (298 females, 246 males); Aged 9-16 years (M = 12.24). Danish School Sample. | DERS | Cross-sectional | Females experienced greater difficulties regulating emotions and more anxiety than males. ED has a significant impact on anxiety and is more predictive of anxiety in females that males. Further, different types of ER difficulties account for anxiety in females and males. |
| Crowell, Beauchaine, Hsiao, Vasilev, Yaptangco, Linehan, & McCauley (2012) | N = 75 adolescent girls; Aged 13-17 years. Adolescent females and mothers. 3 groups (SII, depressed and control *M* age = 16). | DERS | Multi-method multi-informant approach. Two visits one week apart. | Self-inflicted injury group scored significantly higher than depressed adolescents on ED and externalising psychopathology. |
| Lougheed & Hollenstein (2012) | N = 177; Mean Age = 13.6 years; Community Sample of adolescents. | DERS; ASQ; ERQ | Cross-sectional | Adolescents who rely on few ER strategies or lack ER resources show higher levels of internalising problems; whereas broader repertoires of strategies are associated with psychological well-being. |
| McEwen & Flouri (2009) | N = 203 children; Aged 11-18 years (*M* = 14.04, *SD* = 1.91); Socioeconomically disadvantaged area sample | DERS | Cross-sectional | Difficulties in ER mediated the link between fathers' psychological control and adolescents' emotional symptoms. |
| Neumann, van Lier, Gratz, & Koot (2010) | N = 870; Aged 11-17 years (M = 14.34) | DERS | Cross-sectional | Females scored higher on 4 of the 6 DERS sub-scales than male adolescents. |
| Perez, Venta, Garnaat, & Sharp (2012) | N = 218; Mean Age = 15.93 years; Inpatient psychiatric unit assessed within 2 weeks of admission (58.7% females) | DERS | Cross-sectional | Limited access to ER strategies was the only subscale of the DERS to independently predict non-suicidal self-injury in adolescents. |

Appendix M: Table 2 (cont'd). *Empirical Studies Utilising Emotion Regulation Measures*

| Study [a] | Sample Size; Age; Sample Type | Emotional-Regulation Measures | Design | Summary of Results [b] |
|---|---|---|---|---|
| Saritaş & Gencöz (2012) | N = 595 Turkish first-year high school students; Aged 14-17 years. N = 365 mothers; Mean Age = 41.86 years | DERS | Cross-sectional | Adolescents tended to report higher difficulties in ER that their mothers' reports reflected. Mothers' own ER difficulties mediated the relation between mothers' psych symptoms and discrepancy on adolescent ER report difficulties. |
| Seymour, Chronis-Tuscano, Halldorsdottis, Stupica, Owens, & Sacks (2012) | N = 69 adolescents (37 with ADHD); Aged 10-14 years (M age for 2 groups 11.65); Parents and adolescent ratings of ER and depressive symptoms recorded. Parents completed the ERC | DERS; ERC (Shields & Cicchetti, 1997) | Cross-sectional | Results revealed youth with ADHD reported significantly poorer ER ability and more depressive symptoms that those without ADHD. ER was found to mediate the relationship between ADHD and depressive symptoms in adolescents. |
| Vasilev, Crowell, Beauchaine, Mead, & Gatzke-Kopp (2009) | N = 212; Aged 8-12 years (Years 1-3); | DERS (only used in 3rd year); physiological measure | Longitudinal – 3 years | Comparing self-report ER and physiological markers. Validates DERS against a physiological measure. |
| Weinberg & Klonsky (2009) | N = 428; Community sample; Mean age not reported | DERS | Cross-sectional | Initial validation of DERS in adolescents. DERS exhibited robust correlations with psychological problems reflecting ED, specifically depression, anxiety, suicidal ideation, eating disorders, alcohol use, and drug use. |
| Amone-P'Olak, Garnefski, & Kraaij (2007) | N = 294 adolescents from Northern Uganda who has been abducted and had been living in rebel captivity during a period ranging from 1 month to 10 years; Mean Age = 15.8 years | CERQ | Cross-sectional | Strong relationships were found between rumination, blaming others and post-traumatic streets and rumination and internalizing problems. |
| Auerbach, Claro, Abela, Zhu, &Yao (2010) | N = 411 Chinese adolescents (Time 1); 14-19 years (*M* = 16.18); urban high school students | CERQ | Follow-ups once a month over 6 months. | Adolescents who reported higher levels of neuroticism and use of maladaptive cognitive ER strategies were more likely to report greater engagement in risky behaviours following increases in symptoms of depression. |
| Garnefski, Boon, & Kraaij (2003) | N = 129; 14-18 years (*M* = 15.15); secondary school students | CERQ | Cross-sectional | Self-blame, rumination, positive reappraisal, putting into perspective, and catastrophizing all shared significant relationships with depressive symptoms. Evidence to suggest that relationships between cognitive ER strategies and depression symptomatology are consistent across different types of life events. |

Appendix M: Table 2 (cont'd). *Empirical Studies Utilising Emotion Regulation Measures*

| Study [a] | Sample Size; Age; Sample Type | Emotional-Regulation Measures | Design | Summary of Results [b] |
|---|---|---|---|---|
| Garnefski, Kraaij, & van Etten (2005) | N = 271 (51.1% males, 48.9% females) secondary school students from the Netherlands; Aged 12-18 (*M* = 15 years and 4 months) | CERQ | Cross-sectional | ER difficulties may play a greater role in adolescent internalizing than externalizing problems. Cognitive ER strategies were able to explain more of the variance in internalizing problems than externalizing problems. |
| Garnefski, Koopman, Kraaij, & ten Cate (2009) | N = 53 adolescents with a diagnosis of Juvenile Idiopathic Arthritis (JIA); Mean Age = 14.3 years | CERQ | Cross-sectional | Both rumination and catastrophizing were found to be the most important predictors of maladjustment in adolescents. |
| Garnefski, Legerstee, Kraaij, Van Den Kommer, & Teerds (2002) | N = 487 secondary school adolescents; Mean Age = 13 years and 11 months; N = 630 adults from a GP's practice | CERQ | Cross-sectional | Results showed that all cognitive coping strategies were reported significantly less by adolescents than by adults. |
| Kraaiji & Garnefski (2012) | N = 176; Mean Age = 17; 87.9% reported having a chronic illness. Sample obtained from social networking sites and schools for adolescents with a physical disability | CERQ | Cross-sectional | Self-blame, rumination and catastrophizing had a significant positive relationship with depressive symptoms. Both goal-disengagement and goal-reengagement significantly correlated negatively with depressive symptoms. |
| Kraaij, Garnefski, de Wilde, Dijkstra, Gebhardt, Maes, & ter Doesr (2003) | N = 1310 adolescents attending an intermediate vocational education school; Mean age = 18 years | CERQ | Cross-sectional | Cognitive ER strategies related to depressive symptoms, and have a moderating role in the relationship between the amount of stress experienced and depressive symptoms. |
| Massey, Garnefski, Gebhardt, & van der Leeden (2011) | N = 89 adolescents; Aged 13-21 years (15.8 mean); general population sample | CERQ | Completed on-line diary for 3 weeks | Daily goal frustration and cognitive coping strategies may provide important targets for interventions aimed at adolescents with reduced well-being due to headaches. |
| Muris, Mayer, Reinders, & Wesenhagen (2011) | N = 376 non-clinical multi-ethnic adolescents; Mean Age = 15.86 years | CERQ | Cross-sectional | Moderate to large correlations between CERQ subscales were found. |
| Peńa & Pacheco (2012) | N = 248; 11-18 aged Mean Age = 13.99; public schools in Spain | CERQ – short form | Cross-sectional | Acceptance, rumination and catastrophizing explained significant variance in depression. With respect to physical-verbal aggression, results showed that the use of self-blame and rumination only predicted levels of aggression in males but not females. |

Appendix M: Table 2 (cont'd). *Empirical Studies Utilising Emotion Regulation Measures*

| Study [a] | Sample Size; Age; Sample Type | Emotional-Regulation Measures | Design | Summary of Results [b] |
|---|---|---|---|---|
| Rawana & Kohut (2012) | N = 311 adolescents; Mean Age = 15.37; students from urban high school in Ontario with seasonal and non-season depression and control group | CERQ | Cross-sectional | Catastrophizing and rumination were associated with seasonal and non-seasonal depression symptoms. |
| Tortella-Feliu, Balle, & Sesé (2010) | N = 1441 adolescents; Aged 12-17 years (*M* = 14.04); public secondary school students | CERQ (Catalan version) | Cross-sectional | Negative affect determining negative ER to a great extent. Results suggest that negative forms of ER might not only partially mediate the relationship between NA and anxiety and depression; it might also be the case that adolescents scoring high in NA are prone to engage in dysfunctional styles of ER. |
| Hsieh & Stright (2012) | N = 438 (215 males, 223 females) Taiwanese adolescents; Aged 13-15 years Mean age not reported | ERQ (translated into Chinese) | Cross-sectional | Evidence supports the hypothesis that self-concept mediates the relationship between emotional regulation and internalizing problems. |
| Larsen, Vermulst, Eisinga, English, Gross, Hofman, Scholte, & Engels (2012) | N = 1465 adolescents with data at all 3 time points; Mean Age = 13.8 years; secondary school Netherlands. | ERQ: Suppression scale – Reduced from 7-point Likert to 5 in-line with ERQ-CA | Longitudinal – 3 time points (year intervals) | Unidirectional relationship from depressive symptoms to increased use of expressive suppression. |
| Larsen, Vermulst, Geenen, van Middendorp, English, Gross, Ha, Evers, & Rutger (2013) | N = 1753; Mean Age = 13.8 years; 7 secondary schools in suburban and urban areas in the Netherlands. | ERQ – Reduced from 7-point Likert to 5 in-line with ERQ-CA | Longitudinal – 2 time points | Depressive symptoms preceded increase use of suppression 1 year later, but suppression did not precede future depressive symptoms. |
| Betts, Gullone, & Allen (2009) | N = 88 (*n* = adolescents with high self-report depression symptomatology compared to *n* = 44 others with low scores); Aged 12-16 (13.92); schools in Victoria, Australia. | ERQ | Cross-sectional | Adolescents with high depressive symptomatology were found to report higher levels of expressive suppression and lower levels of cognitive reappraisal, than those with low depressive symptoms. |
| Gresham & Gullone (2012) | N = 682 children and adolescents; Aged 10-18 years (*M* = 13.56); schools students in Victoria, Australia | ERQ-CA | Cross-sectional | Higher levels of extraversion and openness predicted greater use of cognitive reappraisal while neuroticism was positively related to suppression use. |
| Gullone, Hughes, King, & Tonge (2010) | N = 1128; Aged 9-15 years; schools in metropolitan Melbourne | ERQ-CA | Longitudinal – 3 data collection points at year intervals | Suppression was reported less for older participants and its use declined with time. Older participants also scores lower on cognitive reappraisal but there was stability over the time of its use. |

Appendix M: Table 2 (cont'd). *Empirical Studies Utilising Emotion Regulation Measures*

| Study [a] | Sample Size; Age; Sample Type | Emotional-Regulation Measures | Design | Summary of Results [b] |
|---|---|---|---|---|
| Hughes, Gullone, Dudley, & Tonge (2010) | N = 21; Aged 10-14 years (M = 13.4); Clinically referred children and adolescents with at least one anxiety disorder | ERQ-CA | Cross-sectional | Those with school-refusal reported less adaptive ER strategies (greater suppression and less cognitive reappraisal) compared to a non-clinical sample. |
| Hughes & Gullone (2011) | N = 533; Aged 11-20 years (*M* = 15.6); community sample | REQ – Domain-specific ER strategies were assessed using the 29-item self-reported BICSI | Cross-sectional | Results indicate that ER moderated relationships between body image concerns and bulimic and depressive symptoms, but not between body image concerns and drive for thinness or anxiety symptoms. Those who reported frequent body image concerns were more likely to have higher levels of bulimic symptoms if they tended to use avoidance and internal dysfunctional ER strategies. |
| Phillips & Power | N = 225; Aged 12-19 (*M* = 15.06) years; Wide range of socioeconomic groups from the UK. | REQ | Cross-sectional | Initial validation of REQ in adolescents. The use of internal and external functional regulatory strategies were not related to psychosomatic health problems. |
| Hughes, Gullone, & Watson (2011) | N = 340; Aged 9-15 years; Reported high levels of depression (*n* = 170) compared to a matched sample of adolescents reporting low levels of depressive symptoms (*n* = 170); schools from Victoria, Australia (*M* age 12.26). | ERICA; ERQ-CA | Cross-sectional | Those with high levels of depressive symptoms reported significantly poorer ER competencies (i.e., lower emotional control, emotional self-awareness and situational responsiveness), and less healthy ER strategy use (i.e., less cognitive reappraisal and greater expressive suppression). |
| Macdermott, Gullone, Allen, King, & Tonge (2010) | N = 1389 adolescent students; Aged 9-16 (*M* = 12.09) years. | ERICA | Cross-sectional | Initial validation of ERICA confirmed. Negative correlations between self-awareness and shame, depressive symptomatology, and parental over-protection. |
| Herts, McLaughlin, & Hatzenbuehler (2012) | N = 1065; Aged 11-14 years; early adolescent sample. | CSMS; CAMS; EESC - Emotional understanding was assessed with an 8-item subscale from the EESC | Longitudinal - time points separated by months rather than years | Stressful life events and peer victimization predicted subsequent increases in ED over a 4-month period. These increases in ED, in turn, were associated with increases in aggression over the subsequent 3 months. Longitudinal mediation models showed that ED mediated the relationship of both peer victimization and stressful life events with aggressive behaviour. |

Appendix M: Table 2 (cont'd). *Empirical Studies Utilising Emotion Regulation Measures*

| Study [a] | Sample Size; Age; Sample Type | Emotional-Regulation Measures | Design | Summary of Results [b] |
|---|---|---|---|---|
| Allen, Tsao, Seidman, Ehrenreich-May, & Zeltzer (2012) | 14-year old male with chronic daily headaches and social anxiety. 17-year old female with whole body pain and depression. | EESC | Case Study | Following weekly, 50-minute individual treatment sessions, the male demonstrated notable improvement in emotional symptoms, ER skills, somatisation, and functual disability. The female showed some improvement on measures of anxiety and depression, although there appeared to be a worsening of pain symptoms and somatisation. |
| Hammond, Westhues, & Hanbidge (2009) | N = 7; Aged 12-14 years (M = 12.4). Contrast group of N = 8, Aged 10-14 (M = 11.5) years. | EESC; CAMS | Evaluating an ER program. Quasi-experimental with intervention and contrast group | Results of the study showed that the booster group had significant increases on 4 of 10 outcome measures emotional awareness, emotional expressiveness, number of identified body cues, and number of identified calming activities. |
| Hatzenbuehler, McLaughlin, & Nolen-Hoekaema (2008) | N = 1071 adolescents; Aged 11-14 years; Racially ethnic-diverse students in Grades 6 to 8. | EESC | Longitudinal 2 time points 7-month interval | Adolescents who endorsed same-sex attraction evidenced higher rates of internalizing symptoms at both time points. Structural equation modelling indicated that sexual minority adolescents exhibited greater deficits in emotion regulation (rumination and poor emotional awareness) than their heterosexual peers. Emotion regulation deficits in turn mediated the relationship between sexual minority status and symptoms of depression and anxiety. |
| McLaughlin, Hatzenbuehler, Mennin, & Nolen-Hoeksema (2011) | N = 1065; Grades 6-8; large diverse sample of students | EESC (emotion understand subscale); CAMS (anger management subscale); CSMS | Longitudinal – 2 time points 7-months apart | ER deficits predicted subsequent changes in symptoms of anxiety, aggressive behaviour, and eating pathology, but not depression. In contrast psychopathology did not predict subsequent changes in ED. |
| McLaughlin & Hatzenbuehler (2009) | N = 1065; Grades 6-8; large diverse sample of students | EESC (emotion understand subscale); CAMS (anger management subscale); CSMS | Longitudinal – Short-Term | ED mediated the relationship between stressful life events and changes in internalizing symptoms over time. Sobel's test indicated a significant indirect effect of stressful life events on subsequent symptoms of depression (z ¼ 5.05, p < .001) and anxiety (z ¼ 4.95, p < .001) through ED. |
| Penza-Clyve & Zeman (2002) | N = 208; Aged 9-12 (*M* = 12 years 9 months) years; Community Sample | EESC | Cross-sectional | Initial validation of the EESC. |

Appendix M: Table 2 (cont'd). *Empirical Studies Utilising Emotion Regulation Measures*

| Study [a] | Sample Size; Age; Sample Type | Emotional-Regulation Measures | Design | Summary of Results [b] |
|---|---|---|---|---|
| McLaughlin, Hatzenbuehler, & Hilt (2009) | N = 1065; Aged 11-14 years; racially diverse (86.6% non-white) sample of adolescents | EESC (emotion understand subscale); CAMS (anger management subscale); CSMS | Longitudinal | Peer victimization was associated with increased ED over a 4-month period. Increases in ED mediated the relationship between relational and reputational, but not overt, victimization and changes in internalizing symptoms over a 7-month period. |
| Sim & Zeman (2005) | N = 234 girls in Grades 6 to 8; Mean Age = 12 years and 11 months; public school sample | EESC; CEMS | Cross-sectional | Negative affect, poor awareness of emotion, and non-constructive coping with negative emotion partially mediated the relationship between body dissatisfaction and bulimic behaviours. |
| Sullivan, Helms, Kliewer, & Goddman (2010) | N = 358 (n = 191 5th graders, n = 167 8th graders); Mean Age = 10.7 years (SD = .6) and 13.7 years (SD = .8) respectively, recruitment from high violence and poverty areas in Virginia, USA. | EESC (expressive reluctance subscale); CAMS; CSMS | Cross-sectional | Multiple regression analyses indicated unique associations between relational aggression and expressive reluctance and sadness regulation coping. In contrast, physical aggression, but not relational aggression, was associated with anger regulation coping. |
| Suveg, Sood, Comer, & Kendall (2009) | N = 37 youth with anxiety disorder (22 males, 15 females); Aged 7-15 years (M = 10.47); principle diagnosis of generalized anxiety disorder (n = 27), separation anxiety disorder (n = 12) and social phobia (n = 13). | EESC; CEMS | Pre/Post Treatment Clinical Trial | Treated youth exhibited a reduction in anxiety and increased anxiety self-efficacy and emotional awareness at post-treatment. Treated youth also demonstrated improved coping and less ED with worry but not with anger or sadness. |
| Trosper & Ehrenreich-May (2011) | N = 112 children and adolescents; Aged 7-17 (M = 12.5, SD = 2.9); Participants were consecutively referred for treatment or a mental health assessment at a university-based outpatient clinic specialising in childhood anxiety and mood disorders | EESC | Cross-sectional / Structural diagnostic interview | Results of standard multiple regression analyses indicated a relationship between all three components of the emotion in question. Moderator analyses revealed that age, but not gender, affects the relationship between negative emotionality and self-reported anxiety symptomatology. Results of mediation analyses suggested that emotion expression influences the relationship between negative emotionality and anxiety in older participants (ages 13–17), whereas the direct effect of negative emotionality and anxiety is maintained for younger participants (ages 8–12). |

Appendix M: Table 2 (cont'd). *Empirical Studies Utilising Emotion Regulation Measures*

| Study [a] | Sample Size; Age; Sample Type | Emotional-Regulation Measures | Design | Summary of Results [b] |
|---|---|---|---|---|
| Suveg, Hoffman, Zeman, & Thomassin (2009) | N = 187 children (52% females); Mean Age = 10 years and 3 month (SD = 8.85 months); All generally from middle socioeconomic backgrounds. | EESC; CAMS; CSMS; DERS | Cross-sectional | Dysregulation of emotion was related equally to both anxiety and depression. Poor awareness of emotion experience was related to both anxiety and depression. |
| Laible, Carlo, Panfile, Eye, & Parker (2010) | N = 203; Mean Age = 13.3 years; middle school sample | CEMS | Cross-sectional | Cluster analysis suggested four profiles of adolescents: those moderate on regulation and negative emotionality, those low in both, those high in negative emotionality and low in regulation, those low in negative emotionality and high in regulation. LDF analysis suggested that these profiles of adolescents differed along two dimensions on socio-emotional behavior. |

*Note:* DERS = Difficulties in Emotion Regulation Scale; ER = Emotion Regulation; NSSI = Non-Suicidal Self-Injury; EESC = Emotion Expression Scale for Children; ED = Emotion Dysregulation; SSI = Self-Inflicted Injury; ERQ = Emotion Regulation Questionnaire; M = Mean; SD = Standard Deviation; CERQ = Cognitive Emotion Regulation Questionnaire; ERQ-CA = Emotion Regulation Questionnaire for Children and Adolescents; REQ = Regulation of Emotions Questionnaire; BICSI = Body Image Coping Strategies Inventory; ERICA = Emotion Regulation Index for Children and Adolescents; CSMS = Children's Sadness Management Scale; CAMS = Children's Anger Management Scale; CEMS = Children's Emotion Management Scales.

[a] All full reference for each empirical study can be found under the thesis references section.

[b] Summaries of all empirical results extracted directly from cited study.

## Appendix N: Informed Consent (Copy)

I hereby agree to participate in the survey "Youth Experiences" being conducted by P. Heaven, J. Ciarrochi, P. Leeson and S. Marshall of the University of Wollongong, and N. Caltibiano and K. Simoncini. I understand that the study is about the expectations that students have of themselves, their attitudes, and their expectations of the future. I understand that the survey seeks to understand the factors associated with academic achievement and emotional well-being and assesses a range of positive and negative behaviours.

I have read and understood the information sheet. I understand that I can withdraw from this study at any time without penalty. I also understand that the information I provide is intended to be used for research purposes only. Please sign the consent form and print your name, email and date clearly.

Signed.....

Printed name.....

Email.....

Date.……

## Appendix O: Child Development Supplement (CDS)

During the past month have you felt:

| | | | | | | |
|---|---|---|---|---|---|---|
| **Happy** | Never | Once or twice | About once a week | 2 or 3 times a week | Almost every day | Every day |
| **Interested in Life** | Never | Once or twice | About once a week | 2 or 3 times a week | Almost every day | Every day |
| **Satisfied** | Never | Once or twice | About once a week | 2 or 3 times a week | Almost every day | Every day |

| In the past month… | Never | Once or twice | About once a week | 2 or 3 times a week | Almost every day | Every day |
|---|---|---|---|---|---|---|
| How often did you feel good at managing the responsibilities of your daily life? | 1 | 2 | 3 | 4 | 5 | 6 |
| How often did you feel that you have warm and trusting relationships with other kids? | 1 | 2 | 3 | 4 | 5 | 6 |
| How often did you feel that you had experiences that challenged you to grow or become a better person? | 1 | 2 | 3 | 4 | 5 | 6 |
| How often did you feel confident to think or express your own ideas and opinions? | 1 | 2 | 3 | 4 | 5 | 6 |
| How often did you feel that you had something important to contribute to society? | 1 | 2 | 3 | 4 | 5 | 6 |
| How often did you feel that you belonged to a community like a social group, your school, or your neighbourhood? | 1 | 2 | 3 | 4 | 5 | 6 |
| How often did you feel that our society is becoming a better place? | 1 | 2 | 3 | 4 | 5 | 6 |
| How often did you feel that people are basically good? | 1 | 2 | 3 | 4 | 5 | 6 |
| How often did you feel that the way our society works made sense to you? | 1 | 2 | 3 | 4 | 5 | 6 |

## Appendix P: The 12-Item General Health Questionnaire (GHQ-12)

We would like to know how your health has been in general over the last few weeks. Please answer all the questions by circling the answer you think most applies to you.

| **Have you recently…** | **1** | **2** | **3** | **4** |
|---|---|---|---|---|
| Been able to concentrate on whatever you're doing? | Better than usual | Same as usual | Less than usual | Much less than usual |
| Lost much sleep over worry? | Not at all | No more than usual | Rather more than usual | Much more than usual |
| Felt that you are playing a useful part in things? | More so than usual | Same as usual | Less useful than usual | Much less than usual |
| Felt capable of making decisions about things? | More so than usual | Same as usual | Less so than usual | Much less than usual |
| Felt constantly under strain? | Not at all | No more than usual | Rather more than usual | Much more than usual |
| Felt you couldn't overcome your difficulties? | Not at all | No more than usual | Rather more than usual | Much more than usual |
| Been able to enjoy your normal day-to-day activities? | More so than usual | Same as usual | Less so than usual | Much less than usual |
| Been able to face up to your problems? | More so than usual | Same as usual | Less so than usual | Much less than usual |
| Been feeling unhappy and depressed? | Not at all | No more than usual | Rather more than usual | Much more than usual |
| Been losing confidence in yourself? | Not at all | No more than usual | Rather more than usual | Much more than usual |
| Been thinking of yourself as a worthless person? | Not at all | No more than usual | Rather more than usual | Much more than usual |
| Been feeling reasonably happy, all things considered? | More so than usual | About same as usual | Less so than usual | Much less than usual |

## Appendix Q: Approved Ethics Application

University of Wollongong

**INITIAL APPLICATION APPROVAL**
**In reply please quote: HE10/158**
Further Enquiries Phone: 4221 4457

COPY

2 August 2010

Professor Patrick Heaven,
School of Psychology
University of Wollongong
NSW 2522

Dear Professor Heaven,

Thank you for your response to the HREC review of the application detailed below. I am pleased to advise that the application has been approved.

| | |
|---|---|
| Ethics Number: | HE10/158 |
| Project Title: | The development of personal vulnerabilities and well-being in adolescence (Australian Character Study) |
| Researchers: | Professor Patrick Heaven, Dr Joseph Ciarrochi, Dr Emma Barkus, Dr Peter Leeson, Ms Priscilla Almada |
| Documents Reviewed/Approved: | Standard Application, V Oct 2008 |
| | Letters of support from School Principals (Edmund Rice College, St Patrick's College, Catholic Education – Diocese of Cairns, St Gregory's College, St Mary Star of the Sea College, Diocese of Wollongong Catholic Education Office) |
| | Participant Information Sheet |
| | Letter to Parent/Guardian |
| | Parent/Guardian refusal of consent form |
| | Information for the front of the questionnaire booklet |
| | Consent form for adolescents |
| | Surveys: |
| | Compulsive Internet Use Scale (CIUS) Meerkerk et al., 2009 |
| | Daily Spiritual Experience Scale |
| | Revised Reinforcement Sensitivity Theory (Jackson, 2009) |
| | Schizotypal Personality Scale – selected items (Claridge and Broks, 1984) |
| | Psychological and Behavioural Control (Barber, 1996) |
| | Parental Style – Authoritative (Buri, 1991) |

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CRICOS Provider No: 00102E

University of Wollongong

Empathy (Jolliffe and Farringont, 2006)

Religious Values (Braithwaite & Law, 1985)

Hope (Snyder et al., 2002)

Self-Esteem

Emotional Independence (Jackson, Bagum and Furnham, 2009)

Problem-Solving Orientation

Emotion Regulation Scale (Gratz and Roemer, 2004)

Extracurricular Activities

Happiness

Subjective Well-being

General Health (Goldberg and Hiller, 1979)

Social Support (CASSS; Malecki et al., 1999)

Peer Ratings

Aggressive and Rule Breaking Behaviour (Achenbach, 1991)

Approval Date: 29 July 2010

Expiry Date: 28 July 2011

The University of Wollongong/SESIAHS Humanities, Social Science and Behavioural HREC is constituted and functions in accordance with the NHMRC *National Statement on Ethical Conduct in Human Research.* The HREC has reviewed the research proposal for compliance with the *National Statement* and approval of this project is conditional upon your continuing compliance with this document. As evidence of continuing compliance, the Human Research Ethics Committee requires that researchers immediately report:

- proposed changes to the protocol including changes to investigators involved
- serious or unexpected adverse effects on participants
- unforseen events that might affect continued ethical acceptability of the project.

You are also required to complete monitoring reports annually and at the end of your project. These reports are sent out approximately 6 weeks prior to the date your ethics approval expires. The reports must be completed, signed by the appropriate Head of School, and returned to the Research Services Office prior to the expiry date.

Yours sincerely

A/Professor Steven Roodenrys
**Chair, Human Research Ethics Committee**

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# EMPIRICAL STUDY 1 APPENDICES

**Appendix R:** *Table 1 Latent variable correlations Times 1 and 2*

| | Time 2: Latent Variables | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Non-acceptance | Strategies | Impulse | Goals | Awareness | Clarity | Mental Health | Emotional Well-being | Psychological Well-being | Social Well-being |
| Time 1—Latent Variables | | | | | | | | | | |
| Non-acceptance | .51 | .40 | .29 | .31 | .02 | .41 | .32 | -.21 | -.22 | -.18 |
| Strategies | .42 | .57 | .46 | .40 | -.04 | .48 | .41 | -.35 | -.31 | -.29 |
| Impulse | .36 | .46 | .57 | .36 | -.11 | .42 | .34 | -.30 | -.25 | -.22 |
| Goals | .35 | .45 | .37 | .54 | .07 | .43 | .31 | -.25 | .22 | -.23 |
| Awareness | .07 | .04 | -.02 | .14 | .54 | .07 | -.01 | .12 | .18 | .12 |
| Clarity | .42 | .48 | .40 | .37 | -.02 | .56 | .32 | -.28 | -.23 | .22 |
| Mental Health | .33 | .47 | .34 | .32 | -.11 | .36 | .55 | -.43 | -.38 | -.38 |
| Emotional Well-being | -.22 | -.49 | -.28 | -.20 | .21 | -.26 | -.45 | .56 | .52 | .46 |
| Psychological Well-being | -.18 | -.32 | -.24 | -.14 | .27 | -.21 | -.36 | .46 | .52 | .47 |
| Social Well-being | -.16 | -.31 | -.22 | -.16 | .24 | -.21 | -.35 | .43 | .54 | .53 |

Note: Mental ill-Health as measured with the GHQ-12, Emotional well-being, psychological well-being and social well-being are subscales of the CDS

**Appendix S:** *Table 2 Fits of mean CFA vs mean ESEM model comparisons*

| Model | *df* | $\chi^2$ | RMSEA | CFI | TLI |
|---|---|---|---|---|---|
| CFA Full Model | 9693 | 2139 | .04 | .88 | .87 |
| ESEM Full Model | 2039 | 5177 | .02 | .95 | .94 |

**Appendix T:** *Table 3 Comparisons of CFA 'full' model fits vs ESEM model*

| Model | | RMSEA | CFI | TLI |
|---|---|---|---|---|
| CFA Models | | | | |
| | ER Skills & Mental Health | .04 | .88 | .88 |
| | ER Skills & Emotional Well-being | .04 | .88 | .88 |
| | ER Skills & Psychological Well-being | .04 | .88 | .87 |
| | ER Skills & Social Well-being | .04 | .88 | .87 |
| ESEM Models | | | | |
| | ER Skills & Mental Health | .03 | .95 | .94 |
| | ER Skills & Emotional Well-being | .02 | .95 | .95 |
| | ER Skills & Psychological Well-being | .02 | .95 | .95 |
| | ER Skills & Social Well-being | .02 | .95 | .94 |

**Appendix U:** *Table 4 ESEM 'full model' correlations*

| | NonAcceptance | Clarity | Strategies | Impulse | Goals |
|---|---|---|---|---|---|
| Time 1 | | | | | |
| NonAcceptance | .50 | .02 | .35 | .25 | .25 |
| Clarity | -.01 | .39 | -.11 | -.12 | -.02 |
| Strategies | .37 | -.09 | .53 | .41 | .32 |
| Impulse | .30 | -.17 | .40 | .57 | .30 |
| Goals | .30 | -.09 | .38 | .32 | .54 |

**Appendix U:** *Table 5 CFA 'full model' correlations*

| | NonAcceptance | Clarity | Strategies | Impulse | Goals |
|---|---|---|---|---|---|
| Time 1 | | | | | |
| NonAcceptance | .51 | .41 | .40 | .30 | .31 |
| Clarity | .43 | .56 | .49 | .40 | .36 |
| Strategies | .42 | .48 | .57 | .47 | .38 |
| Impulse | .36 | .42 | .47 | .58 | .36 |
| Goals | .35 | .44 | .45 | .37 | .54 |

# EMPIRICAL STUDY 2 APPENDICES

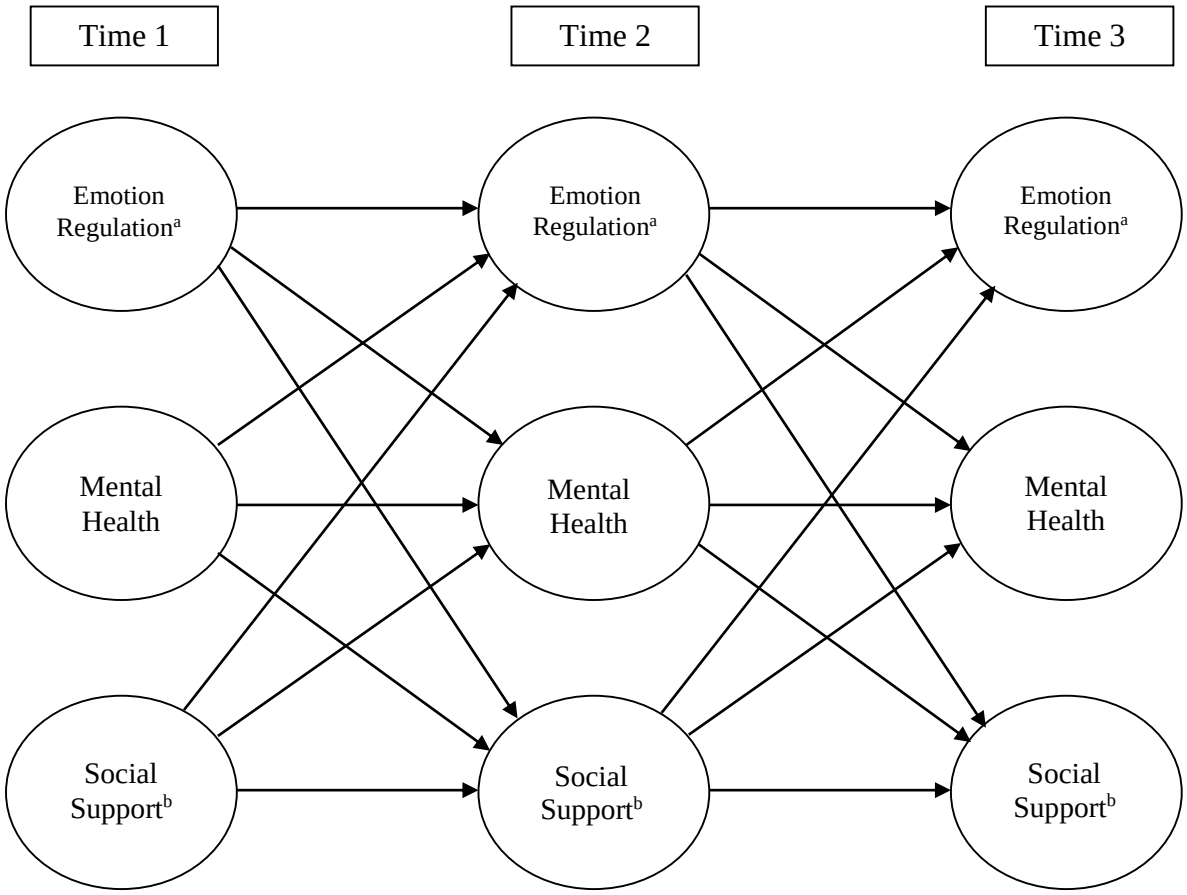
## Appendix V: Student Social Support Scale (Nolten, 1994)

| My Parent(s)… | Never | | | | | Always |
|---|---|---|---|---|---|---|
| 1. Give me good advice | 1 | 2 | 3 | 4 | 5 | 6 |
| 2. Help me find answers to my problems | 1 | 2 | 3 | 4 | 5 | 6 |
| 3. Make suggestions when I'm uncertain | 1 | 2 | 3 | 4 | 5 | 6 |
| 4. Help me practice things I'm involved in | 1 | 2 | 3 | 4 | 5 | 6 |
| 5. Listen to me when I'm mad | 1 | 2 | 3 | 4 | 5 | 6 |
| 6. Help me make decisions | 1 | 2 | 3 | 4 | 5 | 6 |
| 7. Praise me when I do a good job | 1 | 2 | 3 | 4 | 5 | 6 |

| My Teacher(s)… | Never | | | | | Always |
|---|---|---|---|---|---|---|
| 1. Shows me how to do things | 1 | 2 | 3 | 4 | 5 | 6 |
| 2. Makes it okay to ask questions | 1 | 2 | 3 | 4 | 5 | 6 |
| 3. Explains things when I'm confused | 1 | 2 | 3 | 4 | 5 | 6 |
| 4. Is fair to me | 1 | 2 | 3 | 4 | 5 | 6 |
| 5. Gives good advice | 1 | 2 | 3 | 4 | 5 | 6 |
| 6. Tries to answer my questions | 1 | 2 | 3 | 4 | 5 | 6 |
| 7. Cares about me | 1 | 2 | 3 | 4 | 5 | 6 |

| My Close Friend(s)… | **Never** | | | | | **Always** |
|---|---|---|---|---|---|---|
| 1. Gives me advice | 1 | 2 | 3 | 4 | 5 | 6 |
| 2. Helps me when I need it | 1 | 2 | 3 | 4 | 5 | 6 |
| 3. Spends time with me when I'm lonely | 1 | 2 | 3 | 4 | 5 | 6 |
| 4. Accepts me when I make a mistake | 1 | 2 | 3 | 4 | 5 | 6 |
| 5. Calms me down when I'm nervous about something | 1 | 2 | 3 | 4 | 5 | 6 |
| 6. Understands my feelings | 1 | 2 | 3 | 4 | 5 | 6 |
| 7. Explains things when I'm confused | 1 | 2 | 3 | 4 | 5 | 6 |

**Appendix W:** *Figure 1* Conceptual Diagram SEM spanning 3 time points in years 8, 9, and 10




[a] Emotion regulation consisted of 6 individual ER dimensions as latent variables
[b] Social support consisted of three different types, parent, teacher and close friend as latent variables

**Appendix X**: *Table 1*

*Means and standard deviations for key variables across three time points*

| | Time 1<br>Mean (*SD*) | Time 2<br>Mean (*SD*) | Time 3<br>Mean (*SD*) |
|---|---|---|---|
| Strategies | 2.50 (.88) | 2.56 (.93) | 2.55 (.96) |
| NonAcceptance | 2.77 (.94) | 2.81 (.97) | 2.87 (1.01) |
| Awareness | 2.90 (.82) | 2.92 (.86) | 2.87 (.87) |
| Impulse | 2.70 (1.00) | 2.70 (1.02) | 2.67 (1.04) |
| Goals | 3.33 (.95) | 3.36 (.97) | 3.41 (.98) |
| Clarity | 2.72 (.75) | 2.75 (.80) | 2.74 (.83) |
| Mental Health | 1.86 (.53) | 1.96 (.57) | 1.98 (.55) |
| Parent Social Support | 4.73 (1.15) | 4.54 (1.27) | 4.57 (1.24) |
| Teacher Social Support | 4.24 (1.22) | 4.19 (1.31) | 4.26 (1.25) |
| Friend Social Support | 4.93 (1.06) | 4.95 (1.07) | 4.97 (1.01) |

## Appendix Y: Measurement Invariance Tests

Table 2

*Tests for Measurement Invariance With Parental Social Support, Emotion Regulation and Mental Health*

| Model 1 | Chi Square (DF) | RMSEA | CFI | TLI | Model 2 | Chi Square (DF) | RMSEA | CFI | TLI | Chi Square Difference Models 1 & 2 |
|---|---|---|---|---|---|---|---|---|---|---|
| Strategies, Parent Support, Mental Health | 8301 (3042) | .03 | .94 | .93 | Strategies, Parent Support, Mental Health | 8355 (3090) | .03 | .94 | .93 | 54(48) |
| Clarity, Parent Support, Mental Health | 8197 (2376) | .03 | .91 | .91 | Clarity, Parent Support, Mental Health | 8258 (2418) | .03 | .91 | .91 | 61(42) |
| NA, Parent Support, Mental Health | 7201 (2589) | .03 | .94 | .93 | NA, Parent Support, Mental Health | 7255 (2633) | .03 | .94 | .94 | 54(44) |
| Impulse, Parent Support, Mental Health | 7738 (2589) | .03 | .94 | .93 | Impulse, Parent Support, Mental Health | 7786 (2633) | .03 | .94 | .93 | 48(44) |
| Awareness, Parent Support, Mental Health | 6817 (2589) | .03 | .94 | .94 | Awareness, Parent Support, Mental Health | 6870 (2633) | .02 | .94 | .94 | 53(44) |
| Goals, Parent Support, Mental Health | 6491 (2376) | .03 | .94 | .94 | Goals, Parent Support, Mental Health | 6538 (2418) | .03 | .94 | .94 | 47(42) |

*Note.* Tests for invariance involving parental social support, emotion regulation, and mental health across both models

Table 3

*Tests for Measurement Invariance with Teacher Social Support, Emotion Regulation and Mental Health*

| Model 1 | Chi Square (DF) | RMSEA | CFI | TLI | Model 2 | Chi Square (DF) | RMSEA | CFI | TLI | Chi Square Difference Model 1 & 2 |
|---|---|---|---|---|---|---|---|---|---|---|
| Strategies, Teacher Support, Mental Health | 8354 (3042) | .03 | .94 | .93 | Strategies, Teacher Support, Mental Health | 8419 (3090) | .03 | .94 | .93 | 65(48) |
| Clarity, Teacher Support, Mental Health | 8324 (2376) | .03 | .91 | .91 | Clarity, Teacher Support, Mental Health | 8398 (2418) | .03 | .91 | .91 | 74(42) |
| NA, Teacher Support, Mental Health | 7326 (2589) | .03 | .94 | .93 | NA, Teacher Support, Mental Health | 7391 (2633) | .03 | .94 | .94 | 65(44) |
| Impulse, Teacher Support, Mental Health | 7849 (2589) | .03 | .94 | .93 | Impulse, Teacher Support, Mental Health | 7907 (2633) | .03 | .94 | .93 | 58(44) |
| Awareness, Teacher Support, Mental Health | 6939 (2589) | .03 | .94 | .94 | Awareness, Teacher Support, Mental Health | 7003 (2633) | .03 | .94 | .94 | 64(44) |
| Goals, Teacher Support, Mental Health | 6522 (2376) | .03 | .94 | .94 | Goals, Teacher Support, Mental Health | 6579 (2418) | .03 | .94 | .94 | 57(42) |

Note. Tests for invariance involving teacher social support, emotion regulation, and mental health across both models

Table 4

*Tests for Measurement Invariance with Friend Social Support, Emotion Regulation and Mental Health*

| Model 1 | Chi Square (DF) | RMSEA | CFI | TLI | Model 2 | Chi Square (DF) | RMSEA | CFI | TLI | Chi Square Difference Model 1 & 2 |
|---|---|---|---|---|---|---|---|---|---|---|
| Strategies, Friend Support, Mental Health | 8532 (3042) | .03 | .93 | .93 | Strategies, Friend Support, Mental Health | 8595 (3090) | .03 | .93 | .93 | 63(48) |
| Clarity, Friend Support, Mental Health | 8562 (2376) | .03 | .90 | .89 | Clarity, Friend Support, Mental Health | 8628 (2418) | .03 | .90 | .89 | 66(42) |
| NA, Friend Support, Mental Health | 7584 (2589) | .03 | .93 | .92 | NA, Friend Support, Mental Health | 7645 (2633) | .03 | .93 | .93 | 61(44) |
| Impulse, Friend Support, Mental Health | 8021 (2589) | .03 | .93 | .92 | Impulse, Friend Support, Mental Health | 8076 (2633) | .03 | .93 | .92 | 55(44) |
| Awareness, Friend Support, Mental Health | 7110 (2589) | .03 | .93 | .93 | Awareness, Friend Support, Mental Health | 7164 (2642) | .03 | .93 | .93 | 54(53) |
| Goals, Friend Support, Mental Health | 6816 (2376) | .03 | .94 | .93 | Goals, Friend Support, Mental Health | 6870 (2418) | .03 | .94 | .93 | 54(42) |

*Note*. Tests for invariance involving friend social support, emotion regulation, and mental health across both models

## Appendix Z: Models 1 and 2 fit Statistics

Table 5

*Models 1 and 2 fit Statistics for SEM Models*

| Model 1 | Chi Square (DF) | RMSEA | CFI | TLI | Model 2 | Chi Square (DF) | RMSEA | CFI | TLI | Chi Square Difference Model 1 & 2 |
|---|---|---|---|---|---|---|---|---|---|---|
| Strategies, Parent Support, Mental Health | 8470 (3099) | .03 | .94 | .93 | Strategies, Parent Support, Mental Health | 8483 (3108) | .03 | .94 | .93 | 13(9) |
| Clarity, Parent Support, Mental Health | 8365 (2427) | .03 | .91 | .91 | Clarity, Parent Support, Mental Health | 8379 (2436) | .03 | .91 | .91 | 14(9) |
| NA, Parent Support, Mental Health | 7372 (2642) | .03 | .94 | .93 | NA, Parent Support, Mental Health | 7389 (2651) | .03 | .94 | .93 | 17(9) |
| Impulse, Parent Support, Mental Health | 7901 (2642) | .03 | .93 | .93 | Impulse, Parent Support, Mental Health | 7916 (2651) | .03 | .93 | .93 | 15(9) |
| Awareness, Parent Support, Mental Health | 6970 (2642) | .03 | .94 | .94 | Awareness, Parent Support, Mental Health | 6978 (2651) | .03 | .94 | .94 | 8(9) |
| Goals, Parent Support, Mental Health | 6654 (2427) | .03 | .94 | .94 | Goals, Parent Support, Mental Health | 6665 (2436) | .03 | .94 | .94 | 11(9) |

Note. Model fits for structural equation models involving parental social support, emotion regulation, and mental health across both compared models.

[a] Model 1 All autoregressive paths maintained with cross-lag effects constrained to single year spans

[b] Model 2 Constrains all autoregression and cross-lag effects to be consistent across all three waves

Table 6
*Model 1 and 2 fit Statistics for SEM models*

| Model 1 | Chi Square (DF) | RMSEA | CFI | TLI | Model 2 | Chi Square (DF) | RMSEA | CFI | TLI | Chi Square Difference Model 1 & 2 |
|---|---|---|---|---|---|---|---|---|---|---|
| Strategies, Teacher Support, Mental Health | 8523 (3099) | .03 | .94 | .93 | Strategies, Teacher Support, Mental Health | 8531 (3108) | .03 | .94 | .93 | 8(9) |
| Clarity, Teacher Support, Mental Health | 8500 (2427) | .03 | .91 | .91 | Clarity, Teacher Support, Mental Health | 8502 (2436) | .03 | .91 | .91 | 2(9) |
| NA, Teacher Support, Mental Health | 7502 (2642) | .03 | .94 | .93 | NA, Teacher Support, Mental Health | 7513 (2651) | .03 | .94 | .93 | 11(9) |
| Impulse, Teacher Support, Mental Health | 8020 (2642) | .03 | .93 | .93 | Impulse, Teacher Support, Mental Health | 8026 (2651) | .03 | .93 | .93 | 6(9) |
| Awareness, Teacher Support, Mental Health | 7099 (2642) | .03 | .94 | .94 | Awareness, Teacher Support, Mental Health | 7103 (2651) | .03 | .94 | .94 | 4(9) |
| Goals, Teacher Support, Mental Health | 6683 (2427) | .03 | .94 | .94 | Goals, Teacher Support, Mental Health | 6685 (2436) | .03 | .94 | .94 | 2(9) |

Note. Model fits for structural equation models involving teacher social support, emotion regulation, and mental health across both compared models.
[a] Model 1 All autoregressive paths maintained with cross-lag effects constrained to single year spans
[b] Model 2 Constrains all autoregression and cross-lag effects to be consistent across all three waves

Table 7
*Models 1 and 2 fit Statistics for SEM models*

| Model 1 | Chi Square (DF) | RMSEA | CFI | TLI | Model 2 | Chi Square (DF) | RMSEA | CFI | TLI | Chi Square Difference Model 1 & 2 |
|---|---|---|---|---|---|---|---|---|---|---|
| Strategies, Friend Support, Mental Health | 8682 (3099) | .03 | .93 | .93 | Strategies, Friend Support, Mental Health | 8695 (3108) | .03 | .93 | .93 | 13(9) |
| Clarity, Friend Support, Mental Health | 8718 (2427) | .03 | .90 | .90 | Clarity, Friend Support, Mental Health | 8728 (2436) | .03 | .90 | .90 | 10(9) |
| NA, Friend Support, Mental Health | 7743 (2642) | .03 | .93 | .92 | NA, Friend Support, Mental Health | 7757 (2651) | .03 | .93 | .92 | 14(9) |
| Impulse, Friend Support, Mental Health | 8174 (2642) | .03 | .93 | .92 | Impulse, Friend Support, Mental Health | 8188 (2651) | .03 | .93 | .92 | 14(9) |
| Awareness, Friend Support, Mental Health | 7263 (2642) | .03 | .93 | .93 | Awareness, Friend Support, Mental Health | 7266 (2651) | .03 | .93 | .93 | 3(9) |
| Goals, Friend Support, Mental Health | 6966 (2427) | .03 | .93 | .93 | Goals, Friend Support, Mental Health | 6975 (2436) | .03 | .93 | .93 | 9(9) |

Note. Model fits for structural equation models involving friend social support, emotion regulation, and mental health across both compared models.
[a] Model 1 All autoregressive paths maintained with cross-lag effects constrained to single year spans
[b] Model 2 Constrains all autoregression and cross-lag effects to be consistent across all three waves

# Supplementary Materials

# Supplementary Material A: Australian Catholic University Thesis by Publication Outline

Appendices to the Research and Professional Doctorate Degree Regulation (Revised September 2009 and November 2011)

**2.2 PhD by Publication**

2.2.1 A PhD by Publication shall have no stipulated word length, however should conform to the standard outlined below as to the suggested format.

2.2.2 *Introduction and Overview:* The Introduction must establish a coherent and logical framework for the research. It must state the research problem and/or question, the specific aims and overall objectives of the research, the design of the research project and explain how the papers are linked. This is important to provide continuity for the reader. The introductory chapter must be entirely the candidate's own work (that is, no joint authorship). It must demonstrate original and independent critique of other research relevant in the field of study and place the candidate's research in the context of current knowledge.

2.2.3 *The Literature Review:* The Literature Review must contain a clear statement of the significance of the project aims, a critical review of relevant literature, identification of knowledge gaps, and the relationship of the literature to the research. If the published papers include a comprehensive coverage of the relevant literature (or the literature review is published as a paper), then a short section within the introductory chapter which overviews and references key ideas from the literature will suffice. If the published papers together provide a more limited or piece-meal literature review, then a more substantial literature review will be required. This may form a separate section of the thesis to follow the introduction and overview.

2.2.4 *Actual and Potential Published Refereed Papers as Chapters of the Thesis:* Each actual and potential publication is viewed as a chapter and is preceded by an introduction outlining the significance of the publication to the thesis. For example, if the literature review has been published as a refereed paper, it will be necessary for the candidate to identify how the literature pertains to the overall thesis. If the review has been published several years previously the candidate will need to provide an update of relevant literature in the field in the introductory section of the chapter. If the methodology has been published as a refereed paper the introduction should identify relevant links to refereed papers pertaining to the findings. There should be at least one paper that relates to the findings of the study. The introduction to any actual or potential publication must clearly situate the paper in the context of the overall thesis. (See table below where this has been explained diagrammatically).

2.2.5 *The Review/Discussion:* The Review/Discussion section must integrate the significant findings of the thesis, identify the limitations of the research and highlight future directions. This chapter must be entirely the candidate's own work.

2.2.6 *List of References:* The reference list should include all references cited in the Introduction and Overview, the published papers and the review /discussion/conclusion chapter.

2.2.7 *Research Portfolio Appendix:* Candidates are required to compile a research portfolio as an appendix which will include:

(a) *Publications:* Provide a list of all actual and potential publications and their status – submitted, accepted or 'in press' – along with relevant evidence, that is, proof of refereeing. In the case of a paper accepted for publication, proof of acceptance is also to be provided.

(b) *Copyright:* Where relevant provide a statement to indicate that permission regarding copyright has been obtained from the publishers. A full statement is to be provided and may say "I warrant that I have obtained, where necessary, permission from the copyright owners to use any third-party copyright material reproduced in the thesis (e.g. questionnaires, artwork, unpublished letters), or to use any of my own published work (e.g. journal articles) in which the copyright is held by another party (e.g. publisher, co-author).

(c) *Statement of Contribution of Others:* The purpose of this statement is to summarise and clearly identify the nature and extent of the intellectual input by the candidate and any co-authors. The statement must be signed by the student, the supervisor and any co-authors. The statement from the student may say "I acknowledge that my contribution to the above paper is X percent, with the actual content fraction in brackets. A written statement from each of the co-authors must also be provided indicating the extent of their contribution and also stating "I acknowledge that my contribution to the above paper is X percent".

(d) *Additional publications:* Provide a list of additional publications and conference presentations produced by the candidate which have relevance to the thesis, but which are not included in it. List these chronologically.

2.2.7 *Published papers:* The total number of research papers may depend upon the nature of the research and the discipline; the important issue is the overall quality and appropriate magnitude of the research and not just the number of papers. The suggested minimum number of papers that form part of the thesis is three publications, two of which must be published, in press, or accepted for publication. Only one paper may be submitted or 'under review'. Given that it is the candidate's work that is being assessed, it is expected that they will usually be the first author of any co-authored papers, with the contribution *normally* being at least 50%. The estimation of how many papers are necessary will depend on the overall objectives and contribution the combined body of work makes to the discipline. It may also depend on the length of the papers, and what contribution the candidate has made to the co-authored papers. Papers must meet the Higher Education Research Data Collection (HERDC) requirements. It is also desirable that papers are published in high quality journals. Any published paper of which the candidate is a joint author may only be included in the thesis provided the work undertaken by the candidate is clearly identifiable. Publications published prior to enrolment in the Higher Degree by Research may not be included. Refereed published conference papers are not acceptable for inclusion in the thesis.

2.2.8 Example structure of a PhD by Publication with linking chapters

| **Chapter 1 Introductory Paper Suggested word length:10,000 words This should:** | **Chapter 2 Literature Review** | **Chapter 3 Methodology** | **Chapter 4 Results and/or Findings** | **Chapter 5 Results and/ or findings** | **Chapter 6 Concluding paper Suggested word length: 10,000 words This should:** |
|---|---|---|---|---|---|
| give an account of how the work fits into the scholarly literature. Demonstrate how the research fits into the discipline through discussion of methodological and epistemological questions (where appropriate) | Linking paper that explains role of published paper(s).<br><br>Published Paper(s) | Linking paper that explains role of published paper(s)<br><br>Published Paper(s) | Linking paper that explains role of published paper(s)<br><br>Published Paper(s) | Linking paper that explains role of published paper(s).<br><br>Published Paper(s) | synthesise the research papers/provide an argument for how they constitute an original contribution to existing knowledge in the field. It may also include a reflection on the research process/limitations, implications that flow from the research and recommendations for further research. |

NB: The above is an example only as structure may vary slightly depending on the discipline and will also be dependent on the number of actual and potential published papers.

## Supplementary Material B: Emotion Regulation Strategy Definitions

### Definitions of each Emotion Regulation strategy contained within each of the assessed self-report measures found in Table 1 of the systematic review

**Cognitive Emotion Regulation Questionnaire (CERQ)** Garnefski, Kraaij, & Spinhoven, (2001).

**Self-blame:** refers to thoughts of putting the blame for what you have experienced on yourself.

**Other-blame:** Refers to thoughts of putting the blame for what you have experienced on the environment or another person.

**Rumination or focus on thought**: Refers to thinking about the feelings and thoughts associated with the negative event.

**Catastrophizing:** Refers to thoughts of explicitly emphasizing the terror of what you have experienced.

**Putting into perspective:** Refers to thoughts of brushing aside the seriousness of the event/emphasizing the relativity when comparing it to other events.

**Positive refocussing:** Refers to thinking about joyful and pleasant issues instead of thinking about the actual event.

**Positive reappraisal:** Refers to thoughts of creating a positive meaning to the event in terms of personal growth.

**Acceptance:** Refers to thoughts of accepting what you have experienced and resigning yourself to what has happened and

**Refocus on planning:** Refers to thinking about what steps to take and how to handle the negative event.

**Difficulties in Emotion Regulation Scale (DERS)** Gratz & Roemer, (2004).

**Nonacceptance** of Emotional Responses (NonAcceptance)

Difficulties Engaging in **Goal**-Directed Behaviour (Goals)

**Impulse** Control Difficulties (Impulse)

Lack of Emotional **Awareness** (Awareness)

Limited Access to Emotion Regulation **Strategies** (Strategies)

Lack of Emotional **Clarity** (Clarity)

**The Emotion Regulation Questionnaire for *children and adolescents* (ERQ & ERQ-CA)** Gross & John, (2003).

**Cognitive reappraisal** is a form of cognitive change that involves construing a potentially emotion-eliciting situation in a way that changes its emotional impact (Lazarus & Alfert, 1964)

**Expressive suppression** is a form of response modulation that involves inhibiting ongoing emotion-expressive behavior (Gross, 1998).

**The Regulation of Emotions Questionnaire (REQ)** Phillips & Power, (2007).

**Internal-functional:** An internal strategy that allows important functions of emotions to provide useful information about situations and to enhance the individual's capacity to deal with them.

**Internal dysfunctional:** An internal strategy that strategies that does not process and use the information in a helpful way, perhaps rejecting or blocking emotions instead, would be considered dysfunctional.

**External-functional:** An external strategy that allows important functions of emotions to

provide useful information about situations and to enhance the individual's capacity to deal with them.

E**xternal dysfunctional:** An external strategy that strategies that does not process and use the information in a helpful way, perhaps rejecting or blocking emotions instead, would be considered dysfunctional.

**The Emotion Regulation Index for Children and adolescents (ERICA)** Macdermott, Gullone, Allen, King, &Tonge, (2010).

**Emotional Control:** Dysregulated negative affect or inappropriate emotional displays (e.g., When things don't go my way, I get upset easily; I have angry outbursts.

**Emotional Self-Awareness:** A factor reflective of emotional awareness and recognition

**Situational Responsiveness:** The ability to react or behave in a socially or situationally appropriate manner, that is, to be sensitive to social cues and to respond appropriately.

**The Emotion Expression Scale for Children (EESC);** Penza-Clyve & Zeman, (2002).

**Emotional Awareness:** The skill of being aware of internal emotion states and experiences

**Lack of Motivation to express negative emotions:** The motivation or reluctance to express or communicate emotions.

**The Children's Emotion Management (CEMS = CSMS + CAMS)** Zeman, Shipman, & Penza-Clyve, (2001).

**Sadness/Anger:** The dysregulated expression and ability to cope with sadness and or anger

## Supplementary Material C: Permission to reproduce the 'Three sequential components of regulatory flexibility and their corresponding abilities'

Dear Dr George Bonanno,
How are you? My name is Loch Forsyth. I am in the final stages of my PhD, I am based out of the Australian Catholic University. My primary supervisor is Professor Joseph Ciarrochi.

I am writing to ask you if I may please have your permission to reproduce your figure of 'Three sequential components of regulatory flexibility and their corresponding abilities' in my thesis?

The figure was in an article of yours and Burton (2003). Regulatory Flexibility: An Individual Differences Perspective on Coping and Emotion Regulation.

I am arguing in the final stages of my thesis for a more progressive approach to understanding and measuring the process of emotion regulation. I believe your model helps highlights these aspects and would be very appreciative if you would allow me to use it. If you grant your permission, an appropriate citation will accompany the figure, as well as a statement which certifies you have approved its use.

If you are unable to grant my use of the figure for whatever reason, I fully understand, and thank you for your time.

Kind Regards

Loch Forsyth

Dear Loch,

You may use the figure. All you have to do is to cite the source of the figure in the figure caption itself and of course in the reference section

George A. Bonanno, Ph.D.
Professor of Clinical Psychology
Department of Counseling and Clinical Psychology
Teachers College, Columbia University
525 West 120th Street, Box 218
New York, NY 10027

phone: 212 678 3468; fax: 212 678 8235
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29.10.2014

## Supplementary Material D: Research Portfolio Appendix

There are three articles intended for publication arising from this thesis. These are 'Chapter 5: Assessing Emotion Regulation, a systematic review of Emotion Regulation.' Chapter 6: Emotion Regulation and Adolescent Mental Health and Well-being: A Longitudinal Investigation. And Chapter 7: Social Support and its Relationship with Adolescent Emotion Regulation and Mental Health: A Three Year Investigation.

**Review Article**

- Results presented to panels at both Confirmation of Candidature and IPPE pre-submission seminar
- Submission Pending

**Empirical Study 1**

- Presented at Contextual Behavioral Science research day June 17th 2013, University of Western Sydney, Bankstown-Sydney
- Presented at Association for Contextual Behavioral Science (ACBS) World Conference Sydney July 10-12th 2013
- Presented at the Higher Degree Research Forum July 22nd 2013 at the Sebel Hawkesbury Resort and Spa
- Peer reviewed by *Journal of Research on Adolescence, Journal of Applied Developmental Psychology, Journal of Early Adolescence*

**Empirical Study 2**

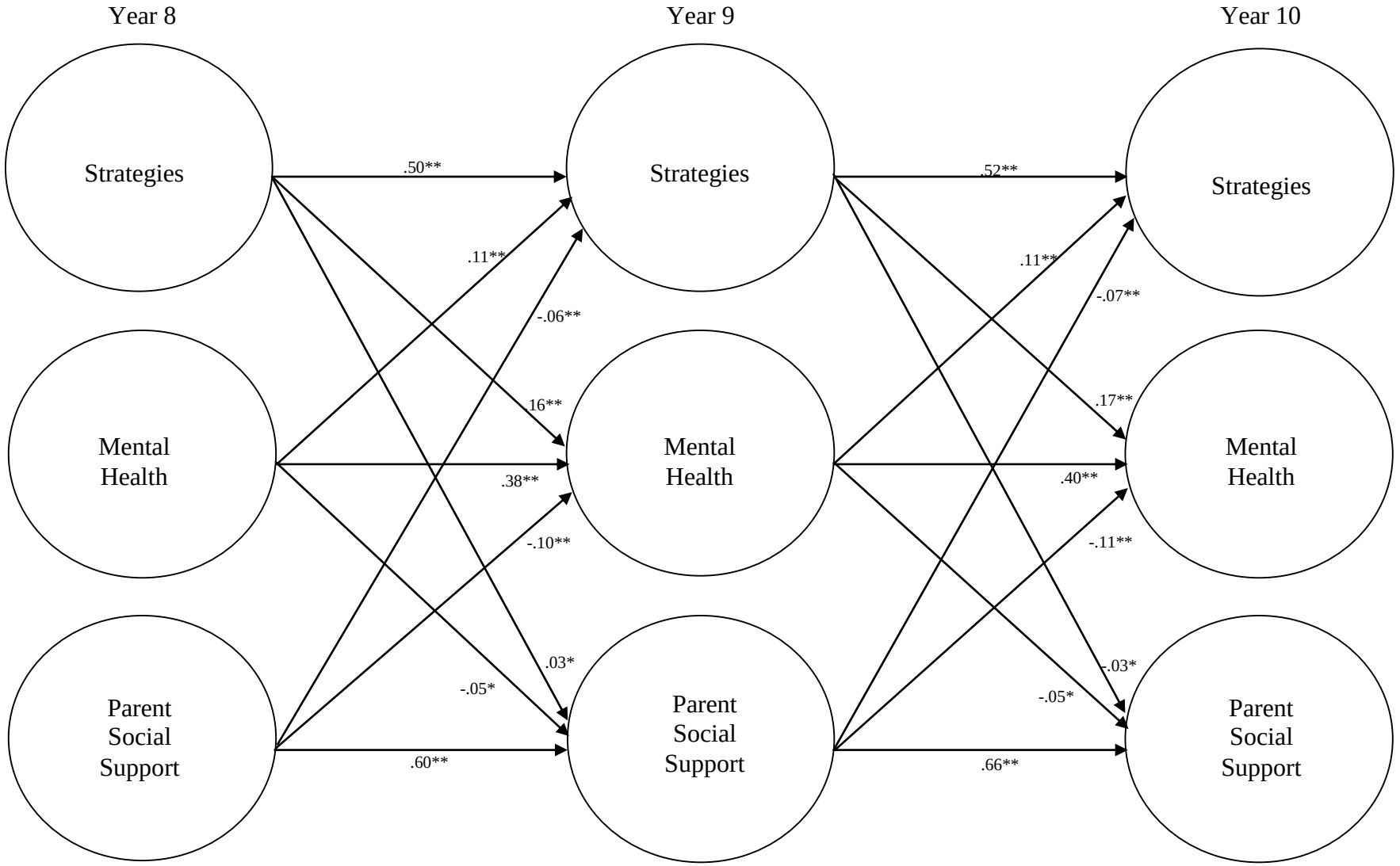
- Presented at the 28th International Congress of Applied Psychology (ICAP) Paris-France, on 13th of July
- Peer reviewed by *Journal of Youth and Adolescence*.

## Supplementary Material E: Statement of Contribution by Others

Mr Loch Forsyth is the sole contributor for all thesis chapters and the lead author and contributor of all of the three major pieces of work intended for publication in this thesis. The level of contribution by other authors is reflected by the author order and percentage as expressed on the page following the title page of each of the three papers.

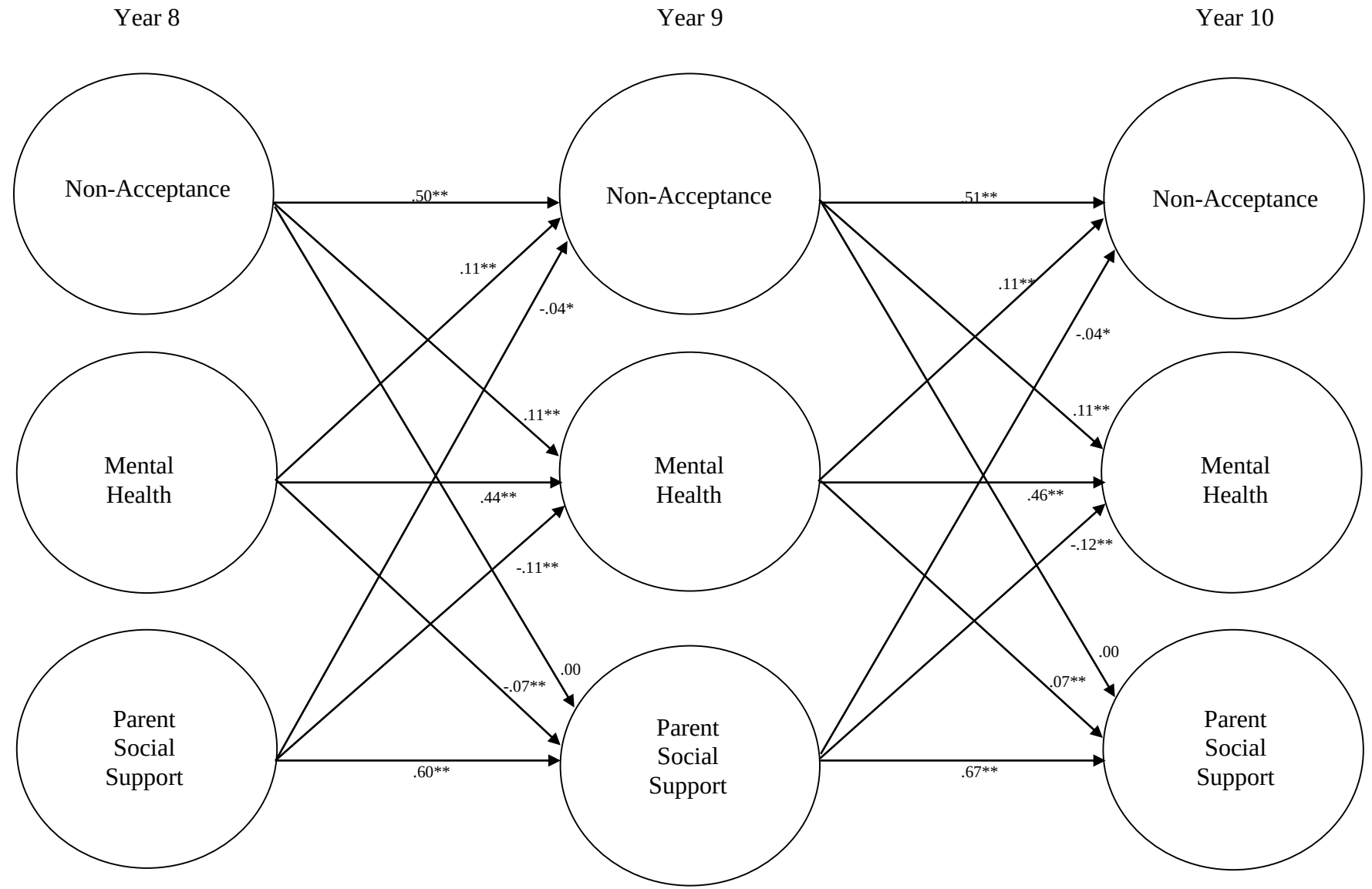
This thesis has undergone professional editing paid for by the candidate. The editing practices and services all complied with the Australian Catholic University's editing guidelines for HDR students.

Supplementary Material F: Empirical Study 2, SEM Model Strategies, Mental Health and Parent Social Support with all Effects




Note: * = .10; ** = .001

Supplementary Material F: Empirical Study 2, SEM Model Non-Acceptance, Mental Health and Parent Social Support with all Effects

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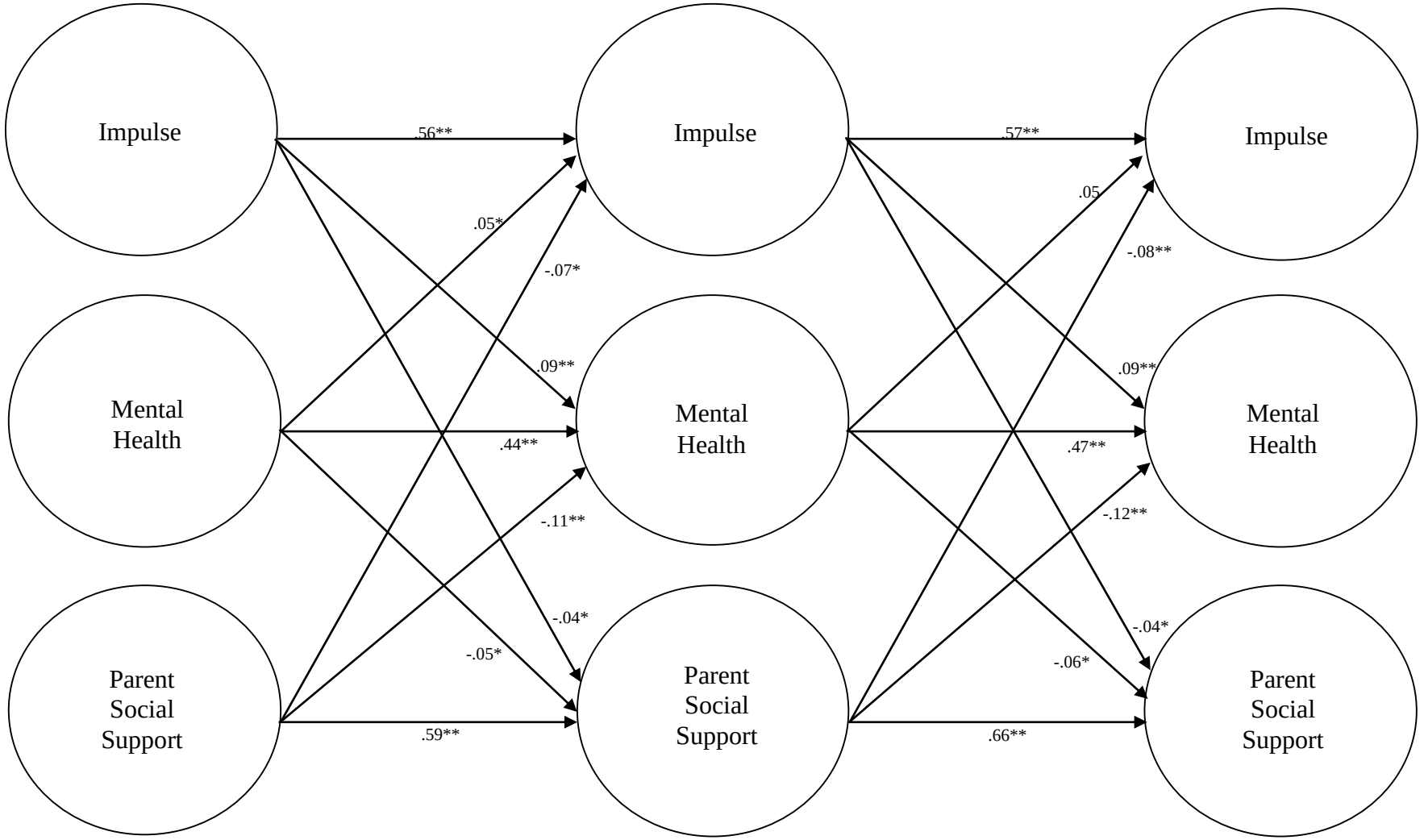
Supplementary Material F: Empirical Study 2, SEM Model Impulse, Mental Health and Parent Social Support with all Effects

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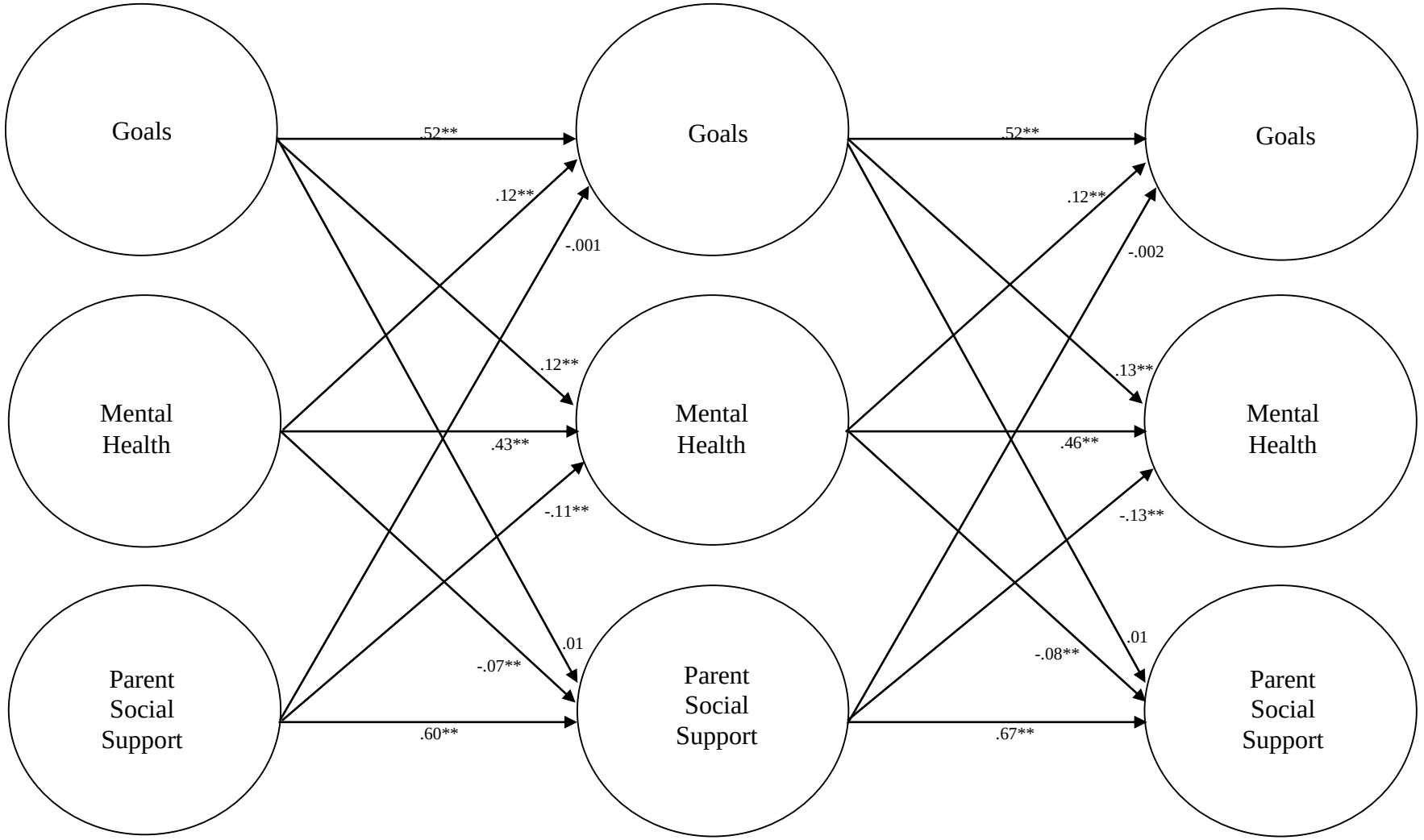
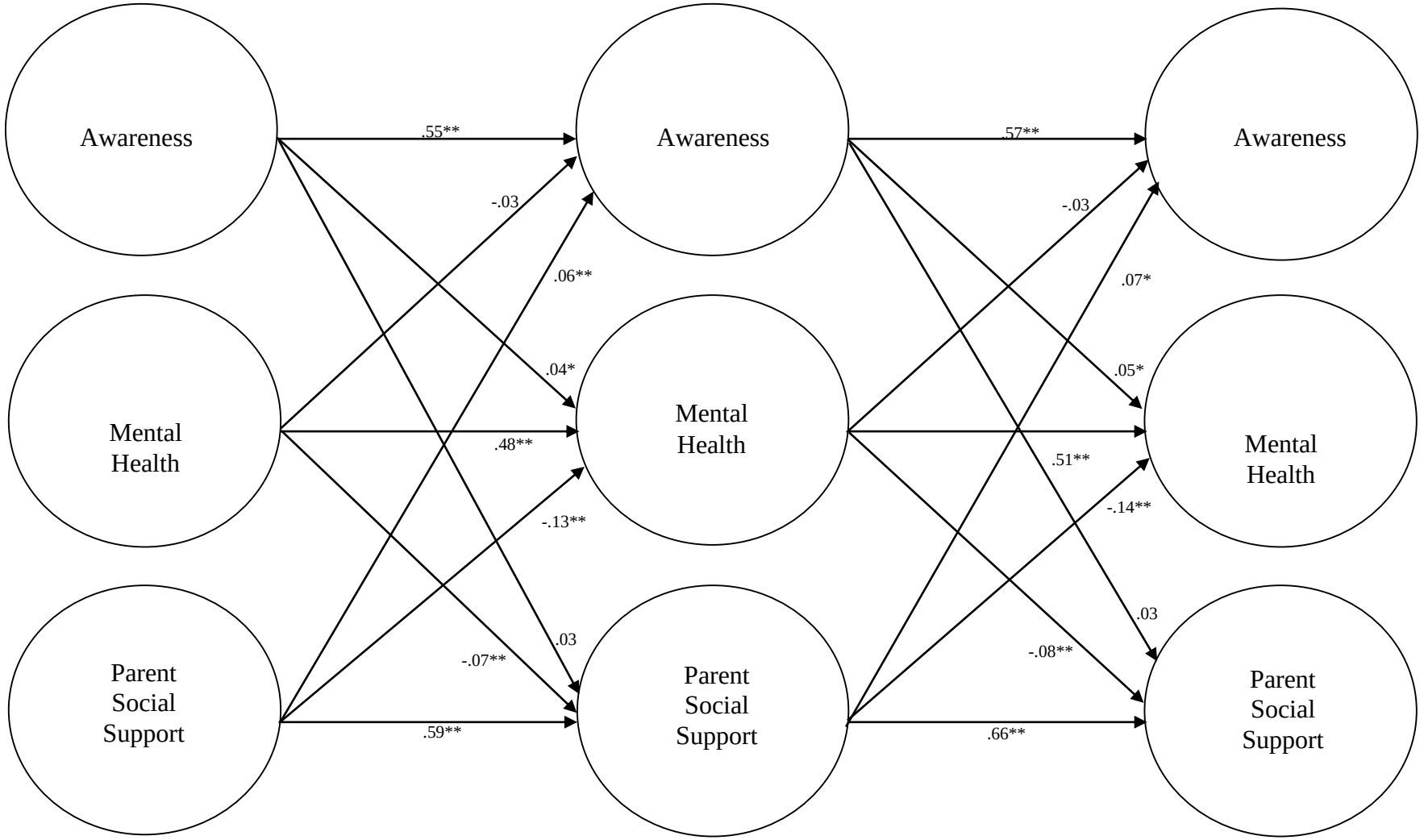
Supplementary Material F: Empirical Study 2, SEM Model Goals, Mental Health and Parent Social Support with all Effects



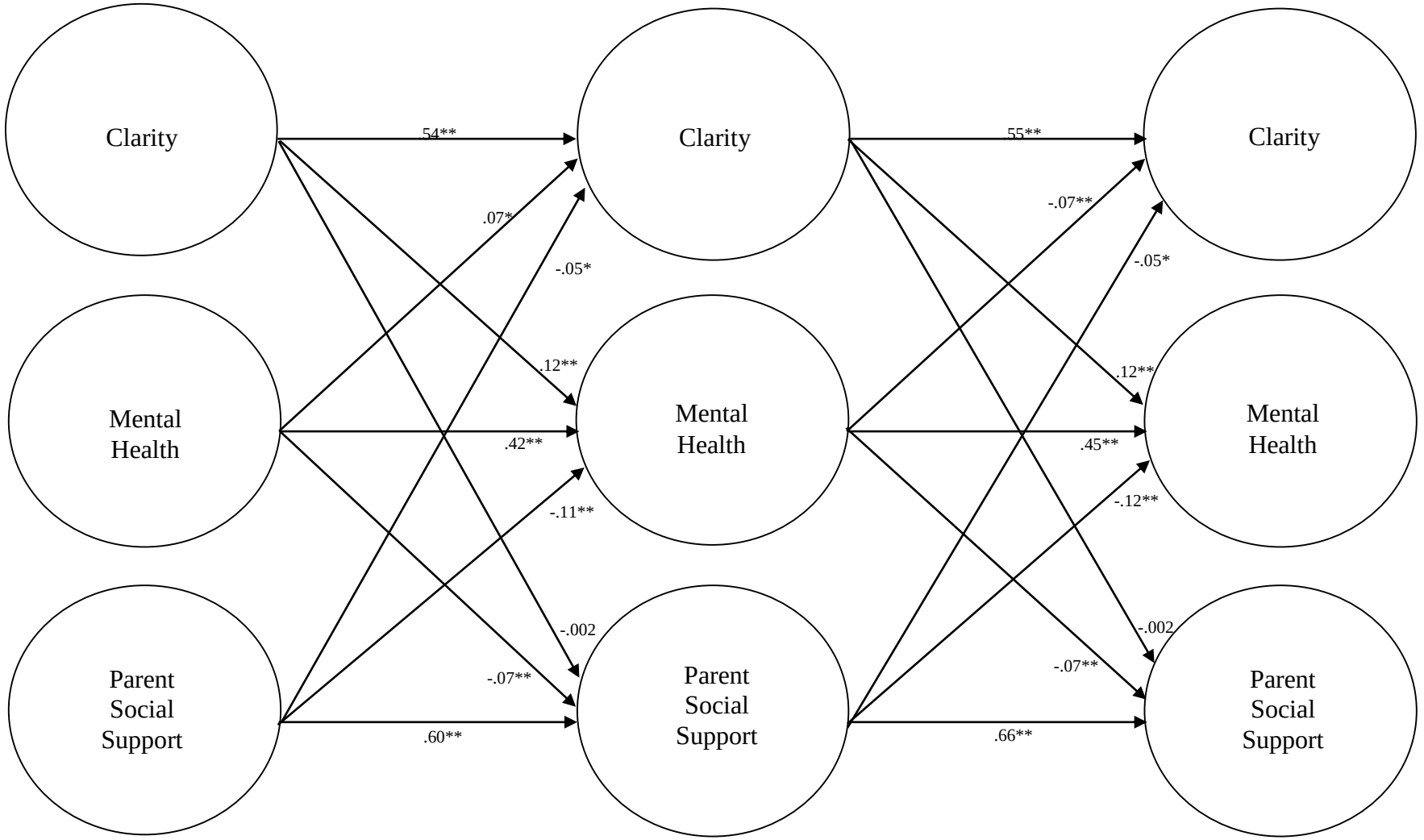

Note: * = .10; ** = .001

Supplementary Material F: Empirical Study 2, SEM Model Awareness, Mental Health and Parent Social Support with all Effects



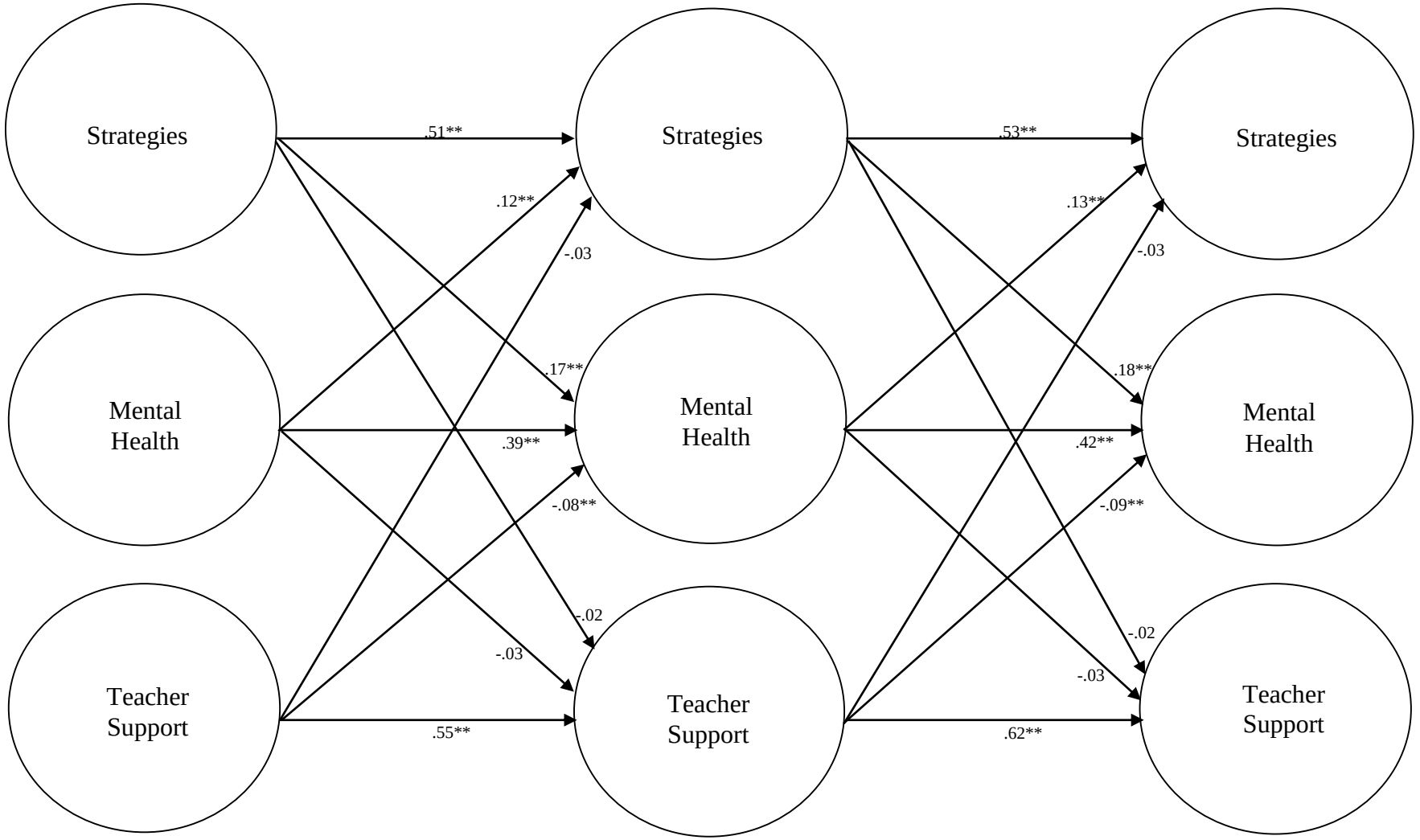

Note: * = .10; ** = .001

Supplementary Material F: Empirical Study 2, SEM Model Clarity, Mental Health and Parent Social Support with all Effects



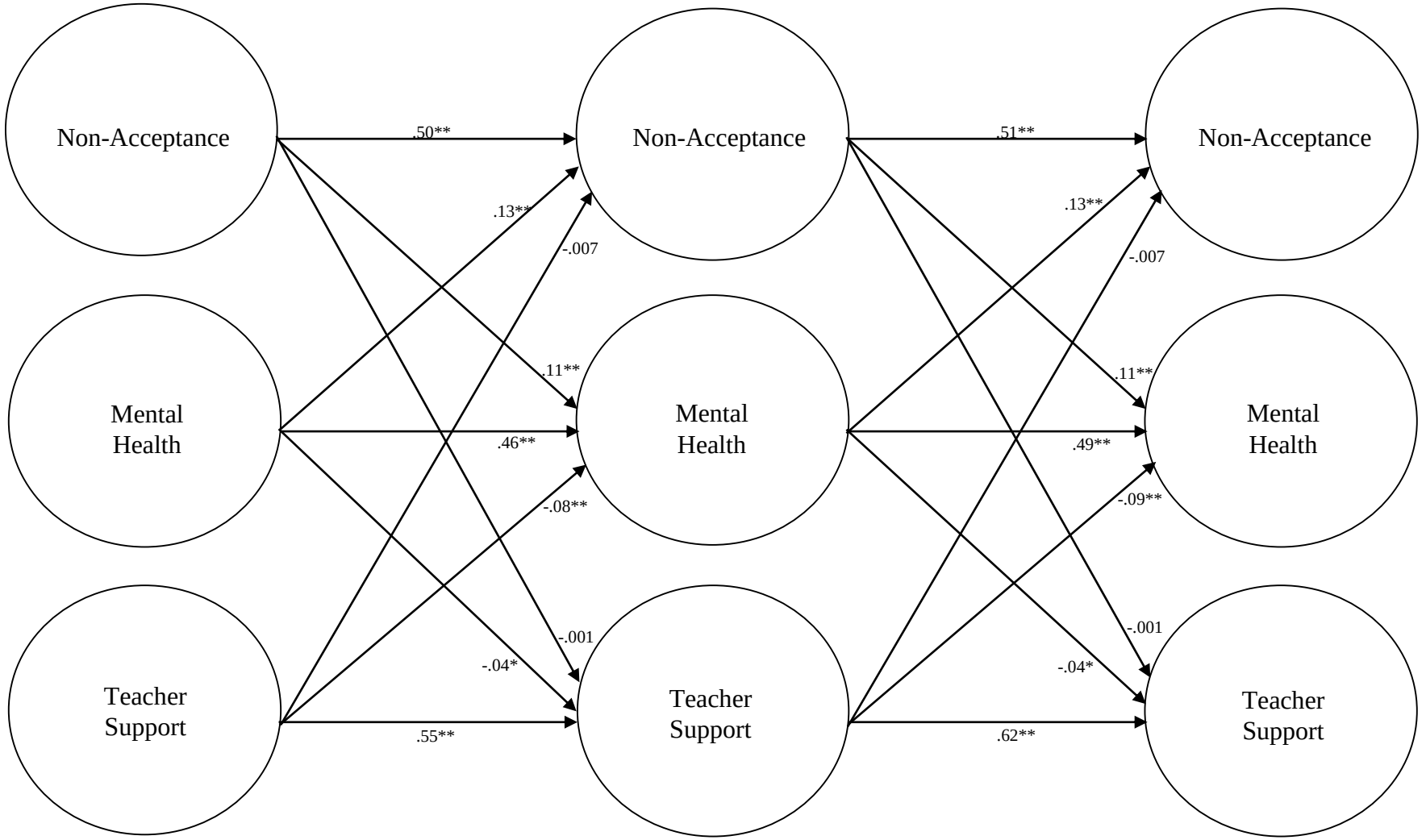

Note: * = .10; ** = .001

Supplementary Material F: Empirical Study 2, SEM Model Strategies, Mental Health and Teacher Social Support with all Effects



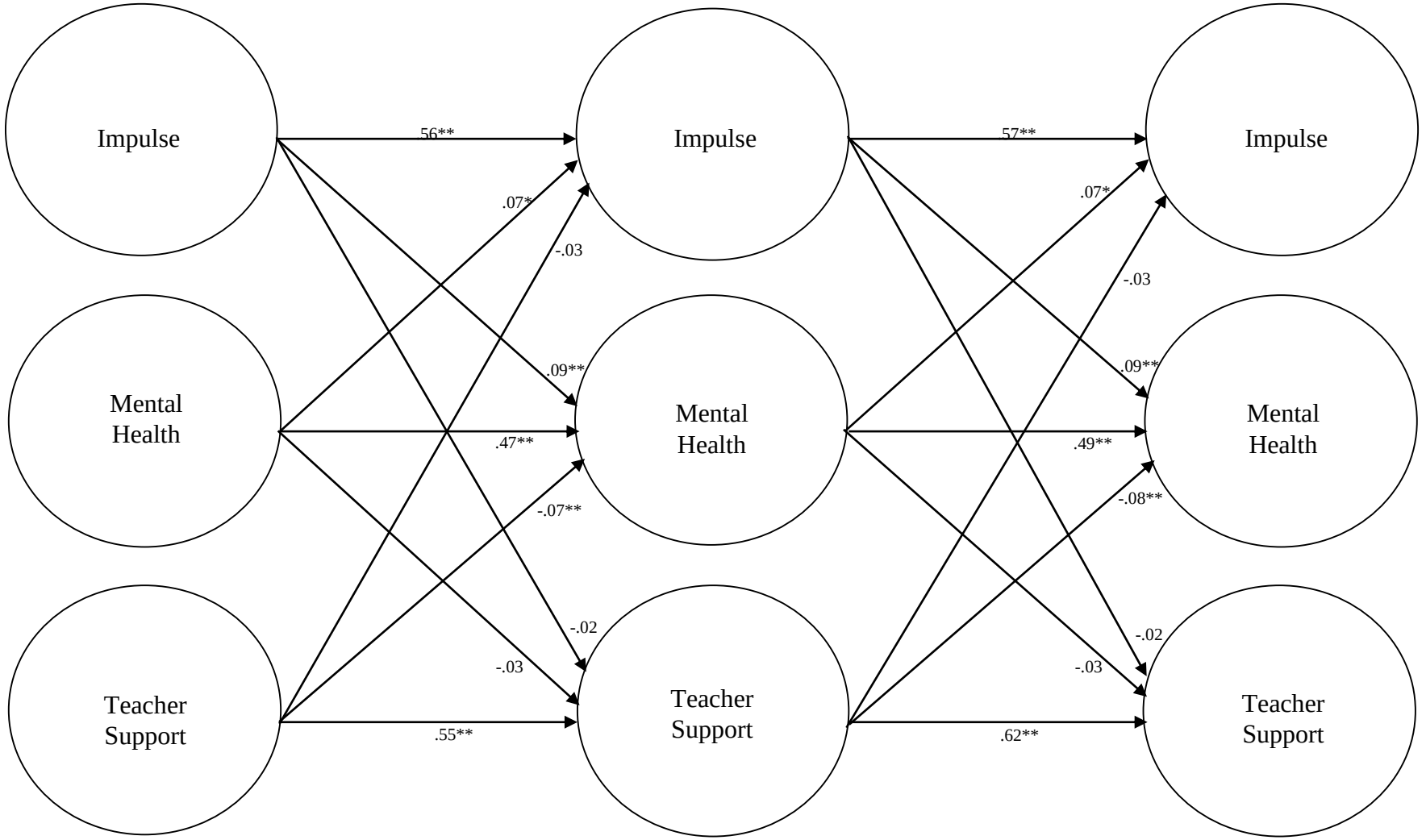

Note: * = .10; ** = .001

Supplementary Material F: Empirical Study 2, SEM Model Non-Acceptance, Mental Health and Teacher Social Support with all Effects



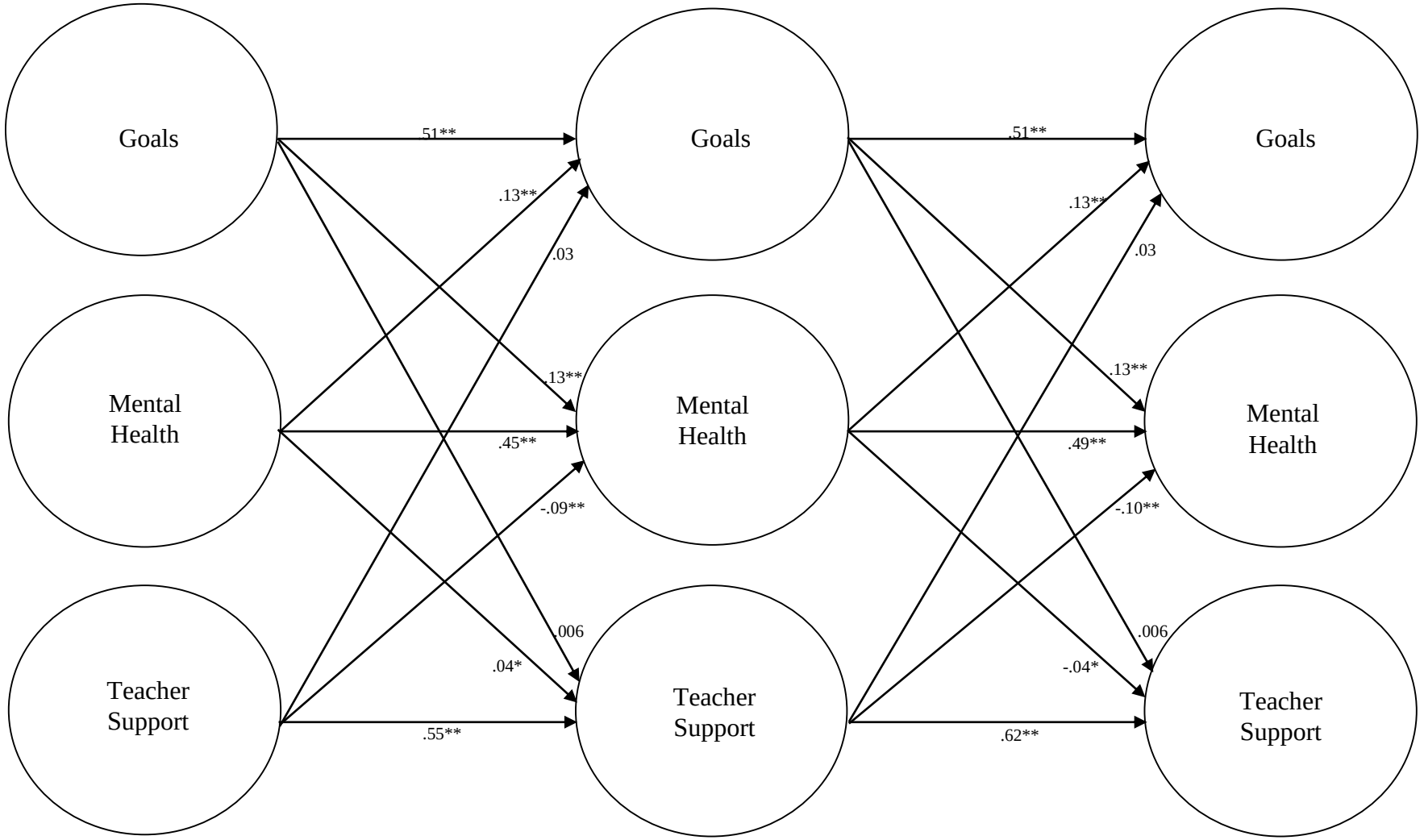

Note: * = .10; ** = .001

Supplementary Material F: Empirical Study 2, SEM Model Impulse, Mental Health and Teacher Social Support with all Effects



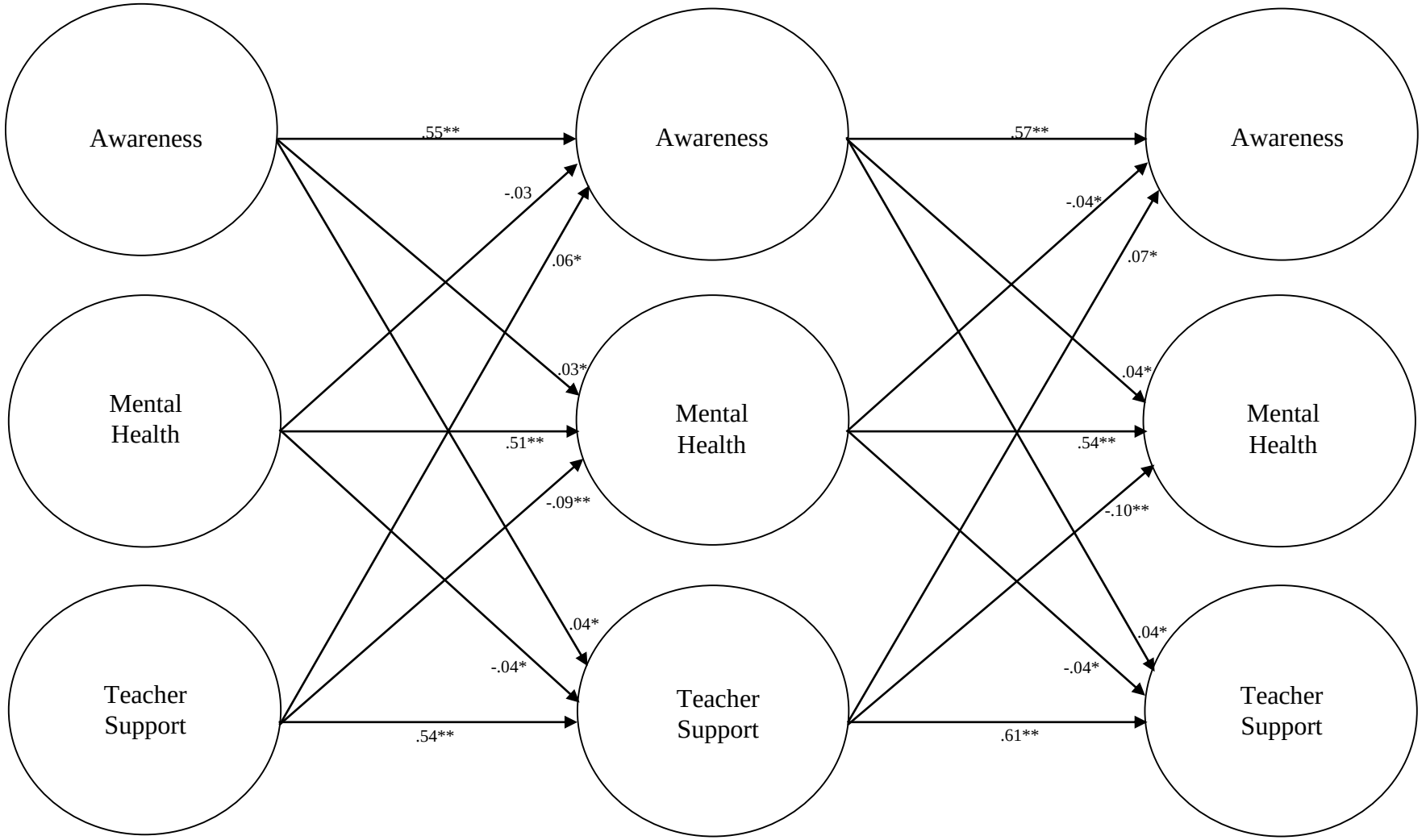

Note: * = .10; ** = .001

Supplementary Material F: Empirical Study 2, SEM Model Goals, Mental Health and Teacher Social Support with all Effects




Note: * = .10; ** = .001

Supplementary Material F: Empirical Study 2, SEM Model Awareness, Mental Health and Teacher Social Support with all Effects

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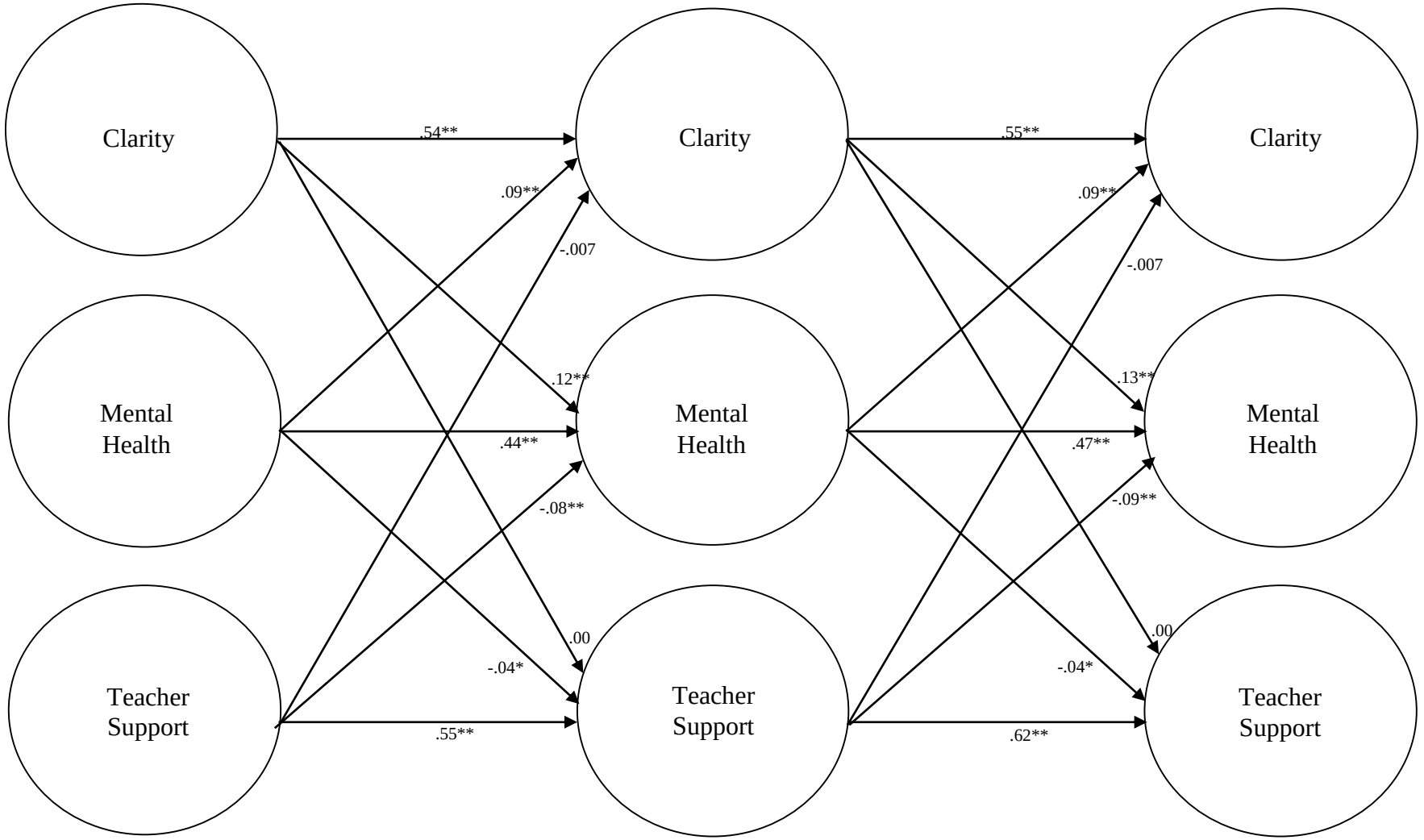
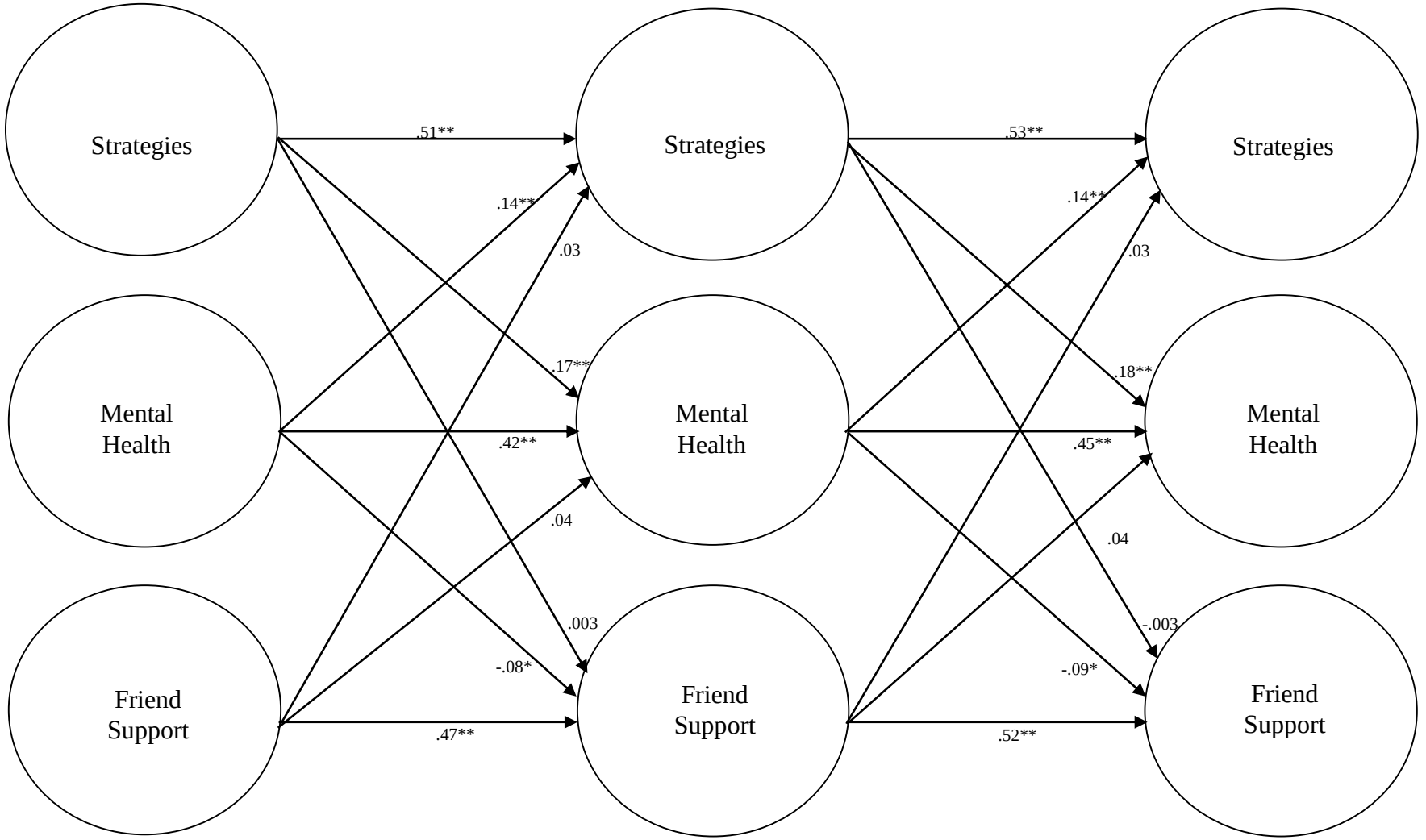
Supplementary Material F: Empirical Study 2, SEM Model Clarity, Mental Health and Teacher Social Support with all Effects




Note: * = .10; ** = .001

Supplementary Material F: Empirical Study 2, SEM Model Strategies, Mental Health and Friend Social Support with all Effects

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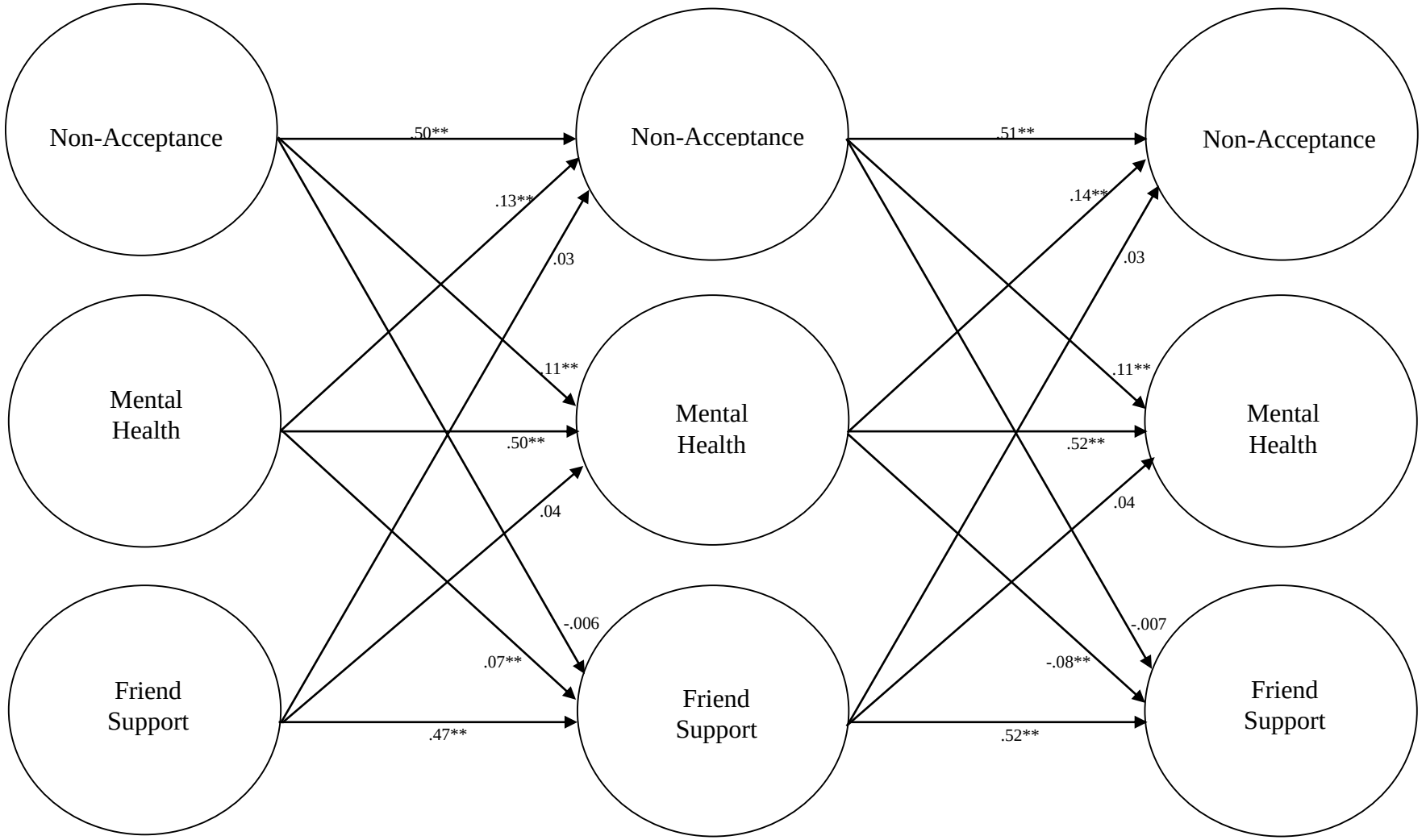
Supplementary Material F: Empirical Study 2, SEM Model Non-Acceptance, Mental Health and Friend Social Support with all Effects

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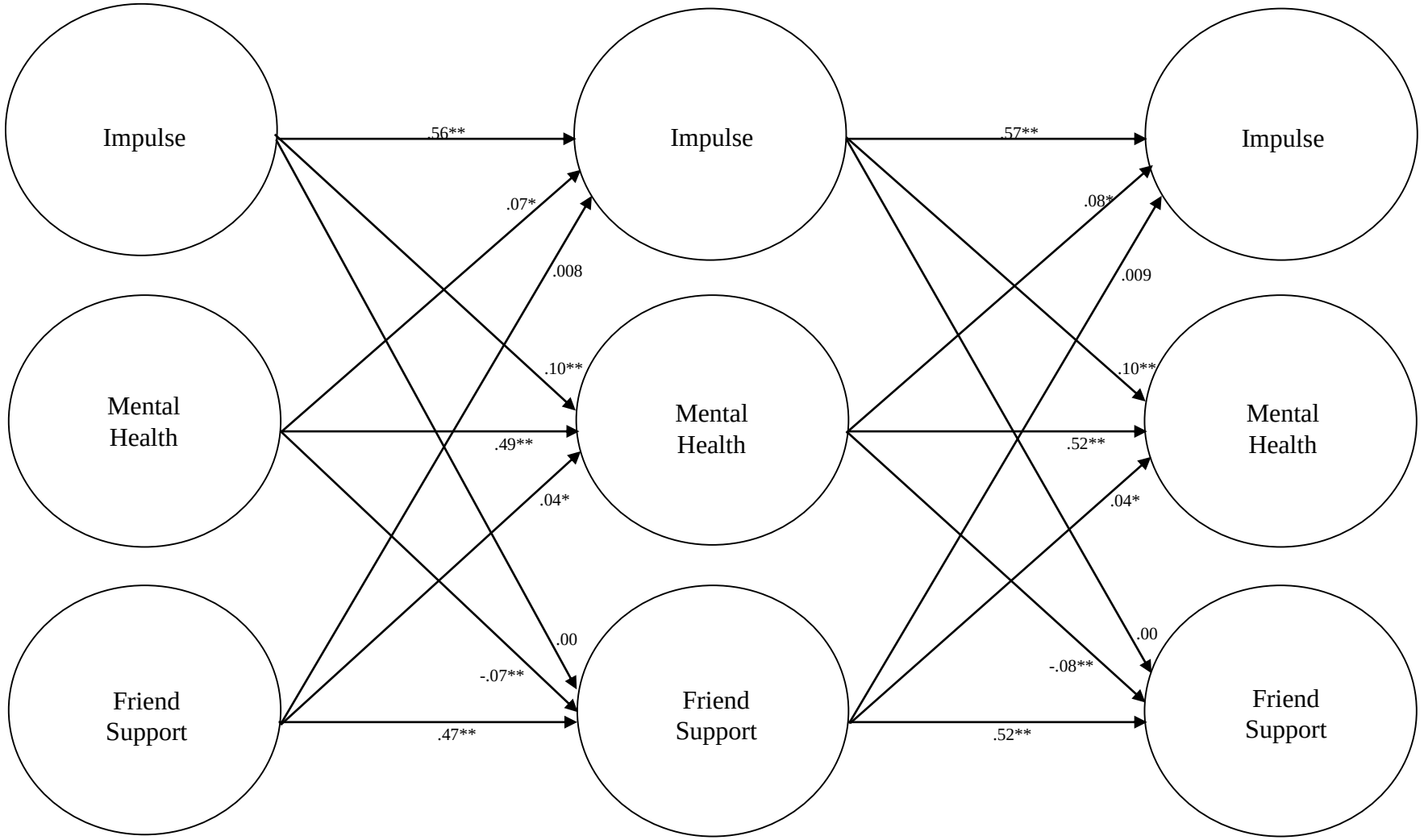
Supplementary Material F: Empirical Study 2, SEM Model Impulse, Mental Health and Friend Social Support with all Effects

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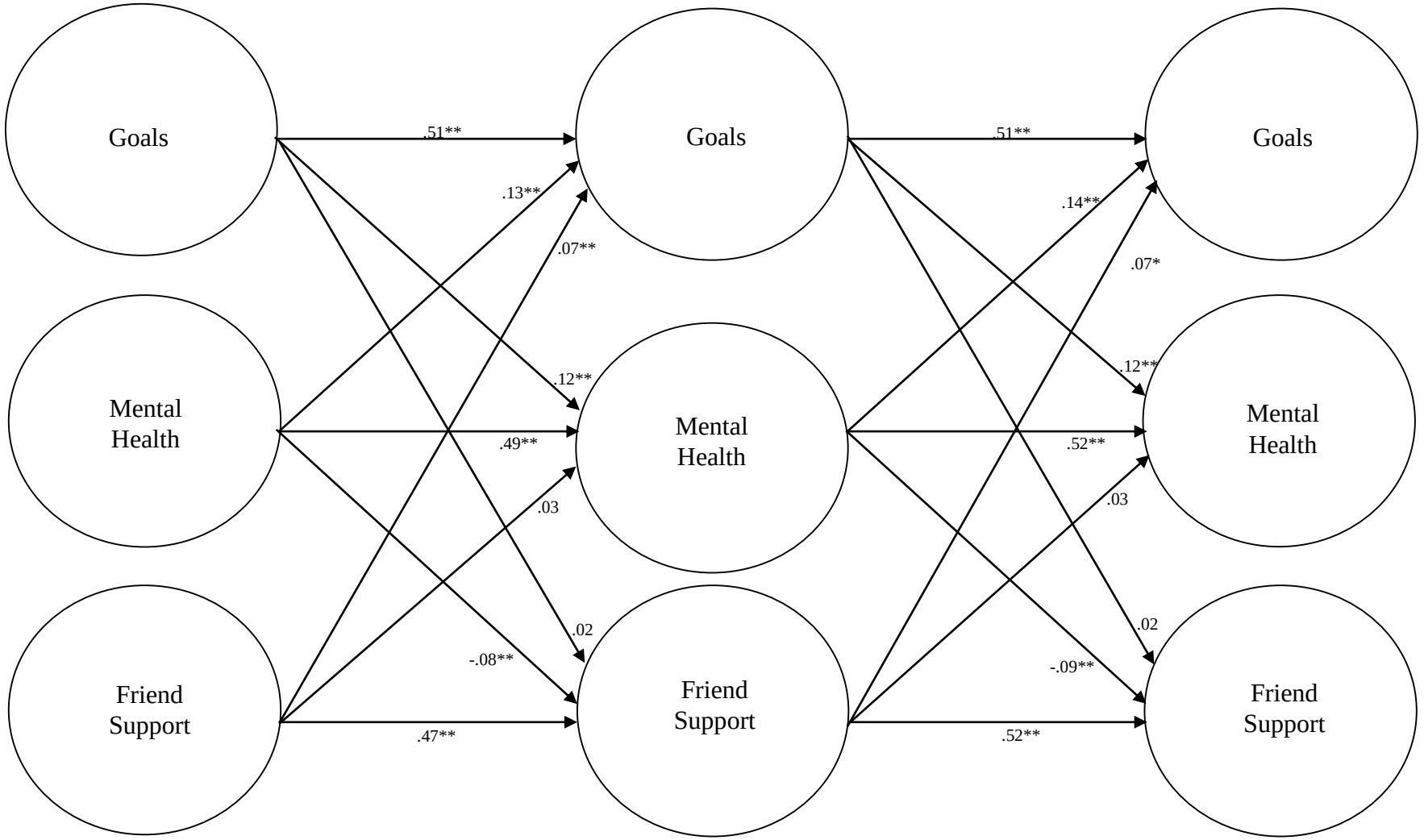
Supplementary Material F: Empirical Study 2, SEM Model Goals, Mental Health and Friend Social Support with all Effects

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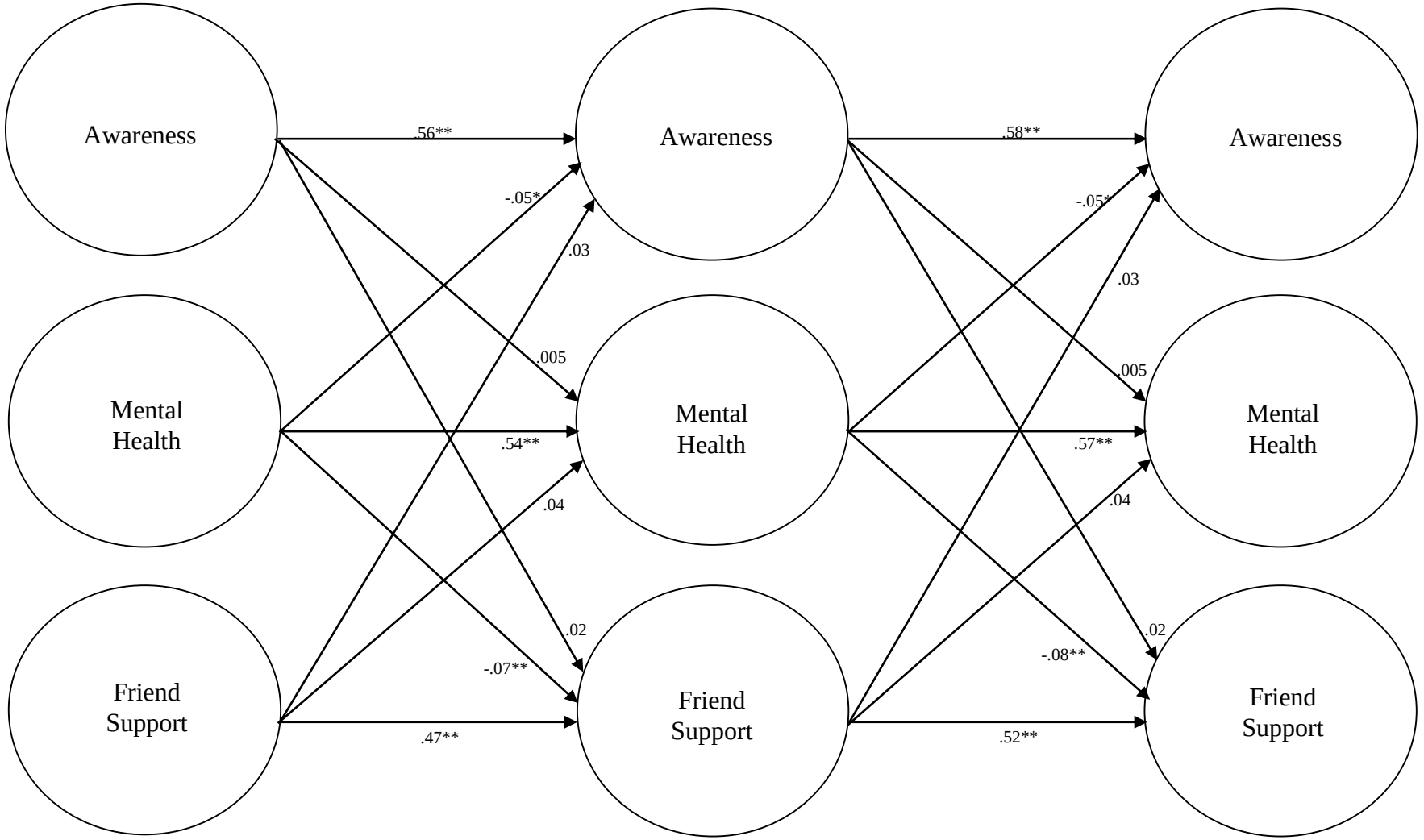
Supplementary Material F: Empirical Study 2, SEM Model Awareness, Mental Health and Friend Social Support with all Effects

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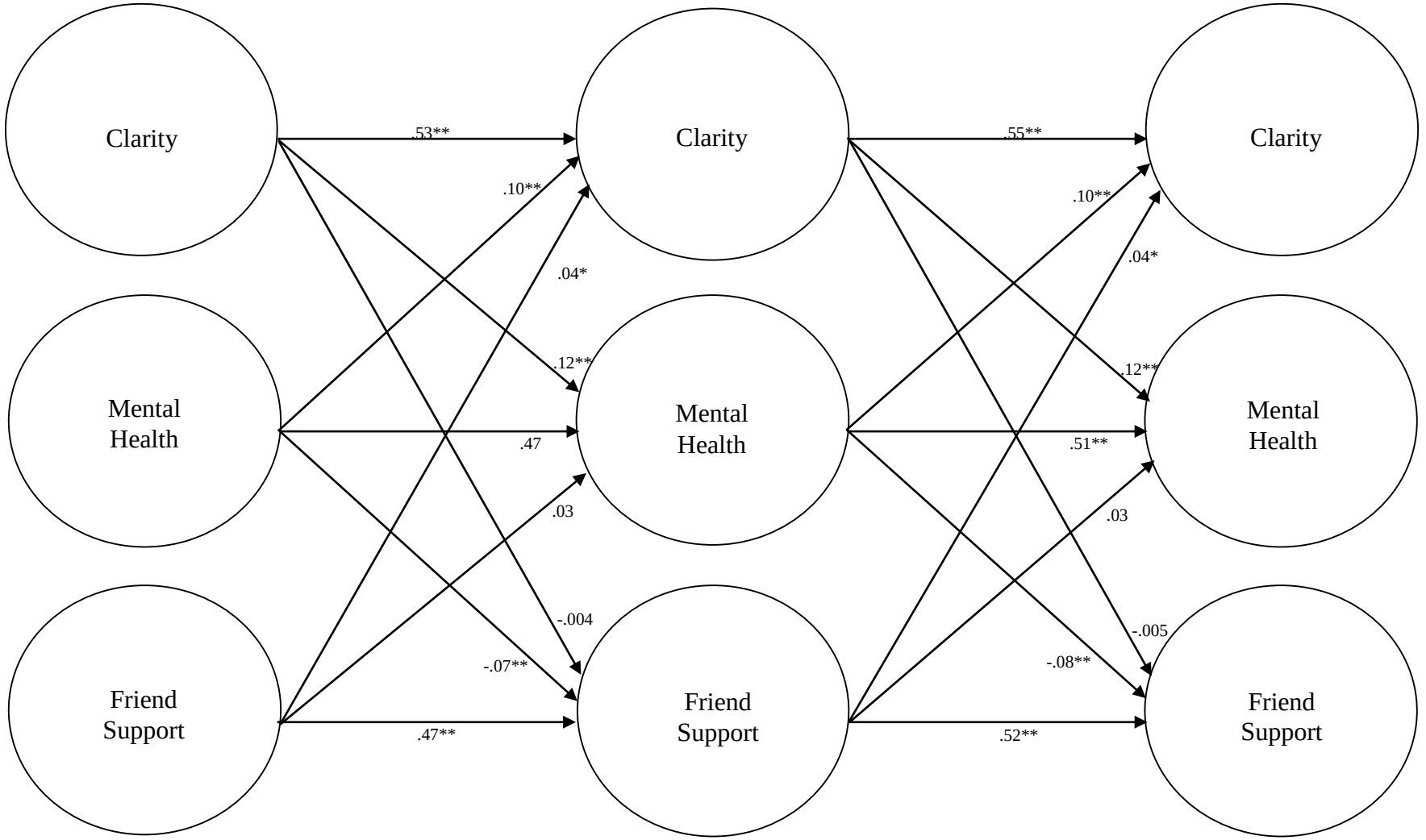
Supplementary Material F: Empirical Study 2, SEM Model Clarity, Mental Health and Friend Social Support with all Effects




Note: * = .10; ** = .001